



**US Army Corps
of Engineers®**

**December 2002
DRAFT**

**ORDNANCE AND EXPLOSIVES (OE) RECURRING
REVIEW REPORT
FORMER NEBRASKA ORDNANCE PLANT
MEAD, NEBRASKA**



DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896

REPLY TO
ATTENTION OF:

December 16, 2002

Planning, Programs and Project Management Division
Environmental Programs Branch

SUBJECT: Ordnance and Explosives Recurring Review, Former Nebraska Ordnance Plant

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Mr. Craig Bernstein
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Dear Dr. Zurbuchen and Mr. Bernstein,

In October 2001, an Ordnance and Explosives (OE) Recurring Review was conducted at the former Nebraska Ordnance Plant (NOP) near Mead, Nebraska. The OE Recurring Review evaluated the appropriate site-specific factors that may impact the continued effectiveness of the OE response actions for the former NOP.

Enclosed is the Draft OE Recurring Review Report for the former NOP for your review. Please contact me at (816) 983-3563 if you have any questions.

Sincerely,

Ed Louis
Project Manager

Enclosure

cc: PM-E (Read file)
CENWK-OC, Sanders
CENWK-EC-ED, Mehta
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LIST OF ACRONYMS

AFB	Air Force Base
ARDC	University of Nebraska Agriculture Research and Development Center
ASR	Archives Search Report
CEHNC	U.S. Army Engineering and Support Center, Huntsville
CENWK	U.S. Army Corps of Engineers Kansas City District
CENWO	U.S. Army Corps of Engineers Omaha District
CWM	Chemical Warfare Materiel
DERP-FUDS	Defense Environmental Restoration Program for Formerly Used Defense Sites
DoD	Department of Defense
EE/CA	Engineering Evaluation/Cost Analysis
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency, Region VII
FDE	Findings and Determination of Eligibility
FUDS	Formerly Used Defense Site
InPR	Inventory Project Report
NDAI	No DoD Action Indicated
NDEQ	Nebraska Department of Environmental Quality
NOP	Nebraska Ordnance Plant
NRD	Natural Resource District
OB/OD	Open burning/open detonation
OE	Ordnance and Explosives
OU	Operable Unit
PA	Preliminary Assessment
RDX	Cyclotrimethylenetrinitramine
TNT	Trinitrotoluene
UNL	University of Nebraska-Lincoln
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic And Hazardous Materials Agency
UXO	Unexploded Ordnance

0.1 BACKGROUND

An Ordnance and Explosives (OE) Recurring Review was conducted at the former Nebraska Ordnance Plant (NOP) in October 2001. Representatives from U.S. Army Corps of Engineers Kansas City District (CENWK) and Omaha District (CENWO) performed the OE Recurring Review activities. This OE Recurring Review Report evaluates the appropriate site-specific factors that may impact the continued effectiveness of the OE response actions for the former NOP, a Formerly Used Defense Site (FUDS) site located near Mead, Nebraska.

The OE Recurring Review, conducted in October 2001, included a review of existing documentation, identification and review of current and new information, a site visit, and stakeholder meetings. A site visit was conducted to visually confirm the physical condition of the site, and to verify current land use, site accessibility, and other factors affecting public exposure to ordnance risk. Local community members, community leaders, and regulators were interviewed to identify their concerns regarding OE response actions.

Areas of concern, as well as previous response actions, were evaluated during the OE Recurring Review. Areas of concern identified and observed during the OE Recurring Review include:

- Culvert Area (Site 5)
- Landfill Area, Former Wastewater Treatment Plant (Site 8)
- Proving Range (Site 9)
- North Burning Ground (Site 10)
- NRD Reservoir and Potential Landfill Area

One removal action has been implemented to date at the former NOP. A Removal Action was conducted in May 1997 at the Culvert Area (Site 5). At Site 5, approximately 6 acres of land were cleared of surface and subsurface OE to a depth of 4 feet (CMS, 1997). In October 1997, a Statement of Clearance was signed by USACE, which recommended the cleared parcel on Site 5 be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997).

0.2 REVIEW RESULTS AND CONCLUSIONS

The OE Recurring Review did not reveal any recent or future land use changes at and around the former NOP. No accessibility changes were identified during the OE Recurring Review. No evidence was found that the public has been exposed to any intact live rounds at the former NOP in the past 40 years. Therefore, there are no visible DoD-related OE hazards or wastes that remain at the former NOP.

Fencing and signage are in place at Site 5 (Culvert Area), at Site 8 (Landfill Area, Former Treatment Plant), at Site 9 (Proving Range), at Site 10 (North Burning Ground), at the Potential Landfill Area between Sites 9 and 10, and at Site 12 (Bomb Booster Area). These controls were

implemented by the University of Nebraska-Lincoln (UNL) on their own accord. DoD has not recommended fencing or signage based upon risk at any location at the former NOP.

0.2.1 Site 5-Culvert Area

At Site 5, the cattle pens in the area serve as a barrier against foot and vehicular traffic and are adequately protective against public entry to the site. UNL does not conduct activities other than feedlot operations and maintenance (including mowing of grass in the feedlots) at this site. Approximately 6 acres were cleared of surface and subsurface OE to a depth of 4 feet at Site 5 during a 1997 Removal Action (CMS, 1997). In October 1997, a Statement of Clearance was signed by USACE, which recommended the cleared parcel on Site 5 be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997). The Statement of Clearance did not impose any land use restrictions on the parcel. A review of safety hazards revealed negligible risk and unlikely probability that an OE-related accident would occur under current operating conditions. The current response action remains protective, since no land use or accessibility changes were identified in this Recurring Review.

0.2.2 Site 8-Landfill Area, Former Wastewater Treatment Plant

The landfill area at Site 8 is the suspected chemical warfare material (CWM) burial location. The EE/CA stated that insufficient evidence and inaccurate documentation exists regarding the potential CWM burial and classified Site 8 as no DoD action indicated (NDAI) for OE. The potential mustard disposal area was not identified during the Recurring Review site visit. A security fence was installed around the landfill near the suspected CWM burial location in 1994 (Dames & Moore, 1996b). Groundwater monitoring wells were installed downgradient of Site 8 in 1992. Samples from these wells have found no detections of thiodiglycol, an indicator of CWM. No new information regarding the presence of CWM at Site 8 was discovered during the Recurring Review. Results from previous evaluations and studies did not indicate risk. A review of safety hazards revealed negligible risk and unlikely probability that an OE-related accident would occur under current operating conditions.

0.2.3 Site 9-Proving Range, Site 10-North Burning Ground, and Potential Landfill Area

During the OE Recurring Review site visit, empty booster cups, an inert bomb fuze, and other miscellaneous trash were discovered on the shore of the NRD reservoir in the potential landfill area. Warning signs and a gate at the entrance to the reservoir warn of potential hazards in the area. The signs were installed by UNL and were not recommended by DoD. A review of safety hazards conducted as part of this recurring review revealed negligible risk and unlikely probability that an OE-related accident would occur under current operating conditions. Since no new information was identified for these sites during the recurring review, these sites do not pose a threat to the public and do not warrant further investigation for OE.

0.3 *NEXT OE RECURRING REVIEW*

The next projected OE Recurring Review will occur in 2006. There are no anticipated modifications to the OE Recurring Review Plan or to the scope of work for subsequent OE Recurring Reviews.

An Ordnance and Explosives (OE) Recurring Review was conducted at the former Nebraska Ordnance Plant (NOP) in October 2001. This was the first OE Recurring Review performed at the site. Representatives from U.S. Army Corps of Engineers Kansas City District (CENWK) and Omaha District (CENWO) performed the OE Recurring Review activities that included document review, information evaluation, a site visit, and stakeholder meetings. The purpose of this report is to evaluate information collected during the OE Recurring Review and either substantiate that the original response action is still protective as intended or recommend that follow-up action is warranted. The following U.S. Army Corps of Engineers (USACE) personnel participated in the Recurring Review:

Ms. Mary Budny Lyle	CENWK-EC-EB	816-983-3890
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Mr. Brad Lasater	CENWO- ED-GI	402-221-7687

1.1 PURPOSE OF THE REPORT

This OE Recurring Review Report evaluates the appropriate site-specific factors that may impact the continued effectiveness of the OE response actions for the former NOP, a Formerly Used Defense Site (FUDS) site located near Mead, Nebraska (see Drawing 1-1). The former NOP is included in the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), Site Number B07NE0037.

Recurring reviews are intended to determine whether the OE response action continues to minimize explosive risks as originally anticipated in the Action Memorandum. Current guidance suggests this review take place every five years, beginning five years following the completion of the response action. Should a problem with a response action be identified or an incident occurs between scheduled Recurring Reviews, a request for an OE Recurring Review may be submitted to the CENWK office to have the response action reviewed. Stakeholders and regulators are involved in the Recurring Review process. Stakeholders include federal, state, and local officials, community organizations, property owners, and others having a personal interest or involvement in the real property which is to undergo an OE Recurring Review (USACE, 2000). A list of stakeholders who were solicited for input during the Recurring Review is presented in Appendix A.

1.2 REPORT ORGANIZATION

Section 2 of this report provides a site description including chronological history, major events, response actions, and background information. The process by which the OE Recurring Review was conducted and results of the information review and site visit are presented in Section 3. An analysis of current protectiveness of OE response actions at the site is included in Section 4. Section 5 presents conclusions related to OE response actions at the former NOP.

2.1 BACKGROUND INFORMATION

The former NOP is located in Saunders County in eastern Nebraska and covers 17,250 acres (see Drawing 1-1). The facility is approximately 30 miles west of the city of Omaha and 35 miles northeast of the city of Lincoln, the two largest population centers in the State. The former boundary of the NOP is located one mile south of Mead and five miles east of Wahoo. Saunders County has a population of approximately 18,300. The largest community and county seat is Wahoo with approximately 3,500 residents.

The former NOP was constructed at the beginning of World War II as a load, assembly, and pack facility for explosive weapons. Owned by the Department of Defense (DoD) and operated by a contractor, the NOP consisted of an administration area, bomb load lines, bomb booster assembly plant, ammonium nitrate production plant, burning grounds, proving range, demolition area, landfill, sewage treatment plant, and several acres of storage igloos and magazines. The administration area included analytical laboratories, a laundry, and maintenance shops.

Bombs, projectiles, shells, and mines were produced from 1942 to 1945. With the exception of ammonium nitrate, the materials used to manufacture weapons were fabricated elsewhere and shipped to the NOP for assembly. Bombs from 90 pounds to 12,000 pounds were loaded with trinitrotoluene (TNT), amatol (TNT and ammonium nitrate), Tritonal (TNT and aluminum), cyclotrimethylenetrinitramine (RDX), and Composition B (TNT and RDX).

During an interim period from 1945 to 1949, the NOP was decontaminated and used for storage, disposal of bulk explosives and munitions by open burning/open detonation (OB/OD), and for production of ammonium nitrate grade fertilizer. Decontamination procedures included cleaning, flushing, and sweeping the floors, rafters, pipes, and ventilation systems; flushing drainage ditches; and removing and burning contaminated soil. There were 340,000 pieces of ordnance reportedly destroyed in three detonation pits in the area referred to as the burning grounds.

Full-scale production was reactivated during the Korean Conflict in the 1950s. Ordnance products included bombs, projectiles, Nike missile warheads, and rocket motors using TNT, Tritonal, and Composition B. The NOP was operational until 1956 when the facility was deactivated. A chronology of historic milestones at the former NOP is presented in Table 2-1.

2.2 DERP-FUDS PROCESS AT NOP**2.2.1 Archives Search Report**

In July 1983, an Archives Search Report (ASR) was completed by Environmental Science and Engineering, Inc. to assess actual or potential contamination from past plant operations. A contamination survey conducted by the U.S. Army Ordnance Ammunition Command in 1959

TABLE 2-1
CHRONOLOGY OF EVENTS
FORMER NEBRASKA ORDNANCE PLANT – MEAD, NEBRASKA

Date	Activity
Dec. 1941	NOP construction contracts are awarded
1942	DoD acquires 6,984 ha, 176 parcels of land for NOP operations
Oct. 1942	First bomb load line is operational
March 1943	Ammonium nitrate plant is operational for DoD purposes
May 1943	Ammonium nitrate production terminated and placed on standby; production area decontaminated
Aug. 1945	Bomb load lines close
Oct. 1945	NOP final decontamination and shut-down
1945-1949	Ammonium nitrate plant is re-activated for emergency fertilizer production; NOP is used for storage of large quantities of explosives
1946	340,000 rounds of ammunition including M102, M104, M115 boosters, fuzes, and detonators destroyed at three pits of unknown location. Debagging of 105-mm propelling charges (100-1200 280-mm Nike war heads)
1951-1953	Full-scale production reactivated at NOP during the Korean Conflict
Feb. 1952	NOP reactivates with National Gypsum
1956	NOP is deactivated
1959	Contamination survey conducted by the U.S. Army Ordnance Ammunition Command
1959	NOP declares excess of Army needs to GSA; except for 4.8 ha in Nike missile area and 862 ha to Offutt AFB for Nike S-1 missile site
1960	389 ha are reassigned to U.S. Army Reserves
1962	University of Nebraska purchases 3,590 ha via quitclaim deed. 2,125 ha purchased by private interests
1964	USAir Force excesses 484 ha and reassigns to the U.S. Army for Mead Army National Guard Facility (in 1969)
1964	University of Nebraska purchases 259 ha via quitclaim deed
1964	118.5 ha sold to private interests via quitclaim deeds
July 1983	USATHAMA Archives Search Report (ASR), 43 references, no site visit, geophysics, or photographic interpretation
1989	Findings and Determination of Eligibility determined that the NOP was formerly used by the DoD. Fireworks Production ceases at Site 12 by Apollo Fireworks and Omaha Pyrotechnics
April 1991	Preliminary Assessment Report completed by USACE as an independent review of ASR
November 1993	Supplementary Archives Search Report completed by USACE
March 1994	Inventory Project Report is prepared for the former NOP. Investigation of the suspected CWM burial area in landfill area at Site 8
Feb. 1996	EE/CA recommends removal action for Site 5, and recommends no further action for Sites 1-4, Site 6, Site 8, Site 9, Site 10, Site 12, and the Laundry Facility
October 1996	Action Memorandum recommended surface and subsurface clearance activities for OE based on land use at Site 5 (culvert area)
June 1997	Site 5 (Culvert Area) Removal Action
April 1999	Partially expended bomblets are discovered on the shoreline of the NRD reservoir during supplemental RI work
October 2001	OE Recurring Review, site visit, document review, stakeholder interviews

indicated that the Bomb Loading Lines (Sites 1-4), the Demolition/Burning Ground Areas (Sites 7 and 10), and the Bomb Booster Assembly Area (Site 12) were contaminated. This contamination was later identified as residual explosives.

2.2.2 Findings and Determination of Eligibility & Preliminary Assessment

A Findings and Determination of Eligibility (FDE) was approved in 1989, which determined that the NOP was formerly used by the DoD. Upon review of the FDE, U.S. Army Engineering and Support Center, Huntsville (CEHNC) conducted a Preliminary Assessment (PA) of Ordnance Contamination in 1991. The purpose of the PA was to provide an independent review of the 1983 ASR. The PA addressed 12 areas using visual and geophysical surveys, trench pits, soil sampling and wipe sampling. The areas, which are indicated in Drawing 2-1, included:

- Bomb Load Lines (Sites 1-4)
- Culvert Area (Site 5)
- Turnout Area (Site 6)
- South Burning Ground (Site 7)
- Landfill Area, Former Wastewater Treatment Plant (Site 8)
- Proving Range (Site 9)
- North Burning Ground (Site 10)
- Detention Pond (Site 11)
- Bomb Booster Assembly Area (Site 12)

The installation was assigned a Risk Assessment Code (RAC) of 2, and it was recommended that further studies be conducted.

2.2.3 Inventory Project Report

An Inventory Project Report (InPR) was prepared in March 1994 by CENWK. Site visits were conducted in December 1989, August 1993, and February 1994 to identify areas where potential OE were present, to gather information on the use and/or disposal of OE and Chemical Warfare Materiel (CWM) at the former NOP, and to establish boundary areas.

2.2.4 Supplementary Archives Search Report

In November 1993, TCT-St. Louis completed a Supplementary ASR that revealed references documenting potential presence of OE. However, none of the references confirmed presence or disposal of CWM (TCT, 1993). An Engineering Evaluation/Cost Analysis (EE/CA) was recommended.

Due to lack of supporting information, seven of the sites identified in the ASR were eliminated from future investigations. Information presented in the 1991 PA, 1993 Supplementary ASR, and other historic documentation indicated the following areas did not warrant further investigation:

- South Burning Ground (Site 7)
- Wastewater Treatment Plant (Site 8)
- Detention Pond (Site 11)
- Around and outside of the Bomb Load Lines (Sites 1-4)

2.2.5 CWM Investigation

In 1994, UNL installed a barbed wire fence at Site 8 in the vicinity of the landfill area near former wastewater treatment plant (Dames & Moore, 1996a). The fence was installed as a precautionary measure at the request of the University of Nebraska Agriculture Research and Development Center (ARDC) due to concerns from the suspected burial of mustard agents. CENWK provided materials to construct the fence and regularly sampled downgradient monitoring wells for mustard related constituents (thiodiglycol) in groundwater. The groundwater monitoring was conducted at the request of the ARDC, and no mustard related constituents have been detected in groundwater to date. USACE has not been able to substantiate the burial.

2.2.6 Engineering Evaluation/Cost Analysis

Dames & Moore completed the Engineering Evaluation/Cost Analysis (EE/CA) Report in February 1996. Field activities conducted for the EE/CA included a site visit in August 1994, subsurface clearance and geophysics investigation in November 1994, and subsurface investigation in April 1995.

The following sites were included for the EE/CA field investigation (Dames & Moore, 1996b):

- Site 5-Culvert Area
- Site 9-Proving Range
- Site 10-North Burning Ground
- Site 12-Bomb Booster Area
- Laundry Facility

Additional sites were reviewed during the EE/CA site visit and were determined to warrant no further investigation (Dames & Moore, 1996b). These sites include:

- Bomb Load Lines (Sites 1-4, sewer systems); investigated as part of Operable Unit 1 (OU-1)
- Turnout Area (Site 6); site of new building for ARDC
- Landfill Area (Site 8); insufficient evidence and conflicting verbal statements pertaining to suspected burial of mustard agent

2.2.7 Action Memorandum

The Action Memorandum, completed by Dames & Moore for CENWK in July 1996, recommended surface and subsurface clearance of OE at the Culvert Area (Site 5) to a depth of 4 feet due to potential excavation and grading activities for the ARDC project to stabilize the creek bank to provide erosion control. The Action Memorandum recommended no further action at the following areas:

- Bomb Load Lines (Sites 1-4)
- Turnout Area (Site 6)
- Landfill Area (Site 8)
- Proving Range (Site 9)
- North Burning Ground (Site 10)
- Bomb Booster Assembly Area (Site 12)
- Laundry Facility

The term no further action was used at the time of the EE/CA and Action Memorandum, however the term has since been changed to no DoD action indicated (NDAI). This document will use NDAI to reflect existing USACE policy.

The recommended alternative for the Culvert Area (Site 5) was to perform clearance activities for OE based on land use. Although Site 5 is considered a remote location and the threat density is very low, surface clearance and subsurface clearance to a minimum 4 feet was recommended.

2.2.8 Removal Action

A Removal Action was conducted in May 1997 at the Culvert Area (Site 5). At Site 5, approximately 6 acres of land were cleared of surface and subsurface OE to a depth of 4 feet (CMS, 1997). Final Removal Report was completed in June 1997 by CMS Environmental, Inc. In October 1997, a Statement of Clearance was signed by USACE, which recommended the cleared 6-acre parcel on Site 5 be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997).

2.2.9 Post-Removal Status

In April 1999, two partially expended incendiary bomblets were found near Site 9 (Proving Range) along the western shore of the Natural Resource District (NRD) reservoir. At the time of the discovery, the reservoir was lowered to accommodate fieldwork (URS, 2000). The locations of these partial bomblets are indicated in Drawing 2-1. Explosive Ordnance Disposal (EOD) from Ft. Riley, Kansas destroyed the OE. The report filed by the 774th EOD Company in response to the finding is included in Appendix B.

The December 2000 OU-3 Feasibility Study Report completed by CENWK notes that U.S. Environmental Protection Agency (EPA) and Nebraska Department of Environmental Quality (NDEQ) suggested deed notice and fence near the NRD reservoir due to uncertainties associated with unknowns including OE. Based upon the findings in the EE/CA and the type of OE debris discovered following the EE/CA, USACE does not concur with the recommendation.

The scope of the OE Recurring Review is dependent upon the response action objectives and the specific response actions implemented. The review evaluates appropriate site-specific factors that may impact the continued effectiveness of the response action. These factors include changes in physical conditions at the site, changes in public accessibility and land use, and the applicability of new technology for addressing a previous technical impracticability determination. The review addresses the following:

- (1) Is the response action functioning as intended?
- (2) Are any assumptions used at the time of response action selection still valid?
- (3) Does new information indicate that the previously selected response is no longer protective of human health, safety, and the environment considering the best available technology?

The OE Recurring Review, conducted in October 2001, included a review of existing documentation, identification and review of current and new information, a site visit, and stakeholder meetings. Representatives from CENWK and CENWO performed the OE Recurring Review, and representatives from CENWK and CEHNC performed a technical review of this report.

3.1 PREVIOUS SITE ACTIONS

A Removal Action was conducted in May 1997 at the Culvert Area (Site 5), at which time approximately 6 acres of land was cleared of surface and subsurface OE to a depth of 4 feet (CMS, 1997). In October 1997, a Statement of Clearance was signed by USACE, which recommended the cleared 6-acre parcel on Site 5 be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997).

3.2 INFORMATION REVIEW

The project team reviewed existing documentation related to site. Through this review, the team determined the actions completed at the site, where OE items are suspected or were located, what assumptions on land use and site accessibility were made for selection of the response action, and whether new information or technology exists that warrants reconsideration of prior decisions. The OE-related documents that were assessed during this review are identified in Table 3-1.

Background information relating to Site 5, where a removal action was completed, is presented subsequently. Background information relating to other sites included in this Recurring Review is also presented in this section.

TABLE 3-1
LIST OF DOCUMENTS USED FOR OE RECURRING REVIEW
FORMER NEBRASKA ORDNANCE PLANT – MEAD, NEBRASKA

Title	Author	Date
Report on Decontamination and Shut-Down of NOP	Nebraska Defense Corporation	Oct-45
Topographic Map, Mead Quad	USGS	Jun-69
Topographic Map, Wahoo East Quad	USGS	Jun-69
Archives Search Report	Environmental Science and Engineering	Jul-83
Aerial Photographic Analysis of NOP	EPA, Region VII	Jul-87
Draft Work Plan for Preliminary Assessment of Ordnance Contamination	TCT-ST. LOUIS	Jul-90
NOP Survey Data	File	Jan-91
Draft Preliminary Assessment of Ordnance Contamination	TCT-ST. Louis	Feb-91
Final Preliminary Assessment of Ordnance Contamination	TCT-St. Louis	Apr-91
Mead Quad Topographic Map, Explosives Contaminated Soils Markup	USACE	Apr-91
NRD Dam 22-A	Soil Conservation Service	Jul-92
Supplementary Archives Search Report	TCT-St. Louis	Dec-93
Memo, Construction of 2 Lakes Near Mead	Saunders County	Feb-94
NOP OU-3 Site Visit	CENWK	Aug-94
OE Waste Information from Dames & Moore	CENWK	Nov-94
Geophysical Investigation Report	Dames & Moore	Jan-95
Work Plan OE Waste Survey for RI	UXB, Int.	Feb-95
Executive Summary NOP Geophysical Data	Sanford Cohen & Associates	Mar-95
Draft EE/CA	Dames & Moore	Jun-95
Final EE/CA	Dames & Moore	Feb-96
Final Remedial Investigation Phase I Preliminary Data Package, OU-3	Woodward-Clyde	Feb-96
InPR, B07NE003700, Mar-94, Revised	CENWK	Nov-96
Action Memorandum	Dames & Moore	Jul-96
Remedial Investigation Report OU-3	Woodward-Clyde	May-97
Statement of Clearance Former NOP Mead, Nebraska	CEHNC	Sep-97
Final Removal Report	CMS Environmental	Jun-97
Final Remedial Action Report for OU-1	OHM Remediation Services	Sep-98
Explosive Ordnance Incident Report	774 th EOD	Apr-99
Remedial Investigation Addendum Report OU-3	URS	Feb-00
General Correspondence	Various	Various

SECTION 3

RECURRING REVIEW PROCESS

3.2.1 Site 5-Culvert Area

Site 5 is approximately 4 acres in size and is located on UNL property. UNL currently operates a cattle feedlot in the area of Site 5. The cattle pens, fencing, and gates serve as a barrier against foot and vehicular traffic. Prior to the 1997 Removal Action, the area contained three partially buried sections of corrugated steel culvert pipe, approximately 48 inches in diameter. A small depression, approximately 10-20 feet in diameter by 1-2 feet deep, is located in the area of the buried pipe. This depression is thought to be the location of a former OB/OD site (CMS, 1997). The PA Report describes this location as a demolition area for tetryl boosters (TCT, 1991). During the EE/CA field investigation, surface clearance was conducted in three 100'x100' grids for geophysics over an area of 0.7 acres at Site 5 (Dames & Moore, 1996b). Potential unexploded ordnance (UXO) was discovered during the EE/CA (Dames & Moore, 1996b). A summary of the subsurface field investigation results conducted during the EE/CA is presented in Table 3-2.

TABLE 3-2
1996 EE/CA GEOPHYSICAL INVESTIGATION
RESULTS OF SUBSURFACE (INTRUSIVE) FIELD INVESTIGATION

Site No.	Total Anomalies	Total Excavated	Number with Inert OE ¹	Number with UXO ²
5	107	79	33	1
9	103	103	0	0
10	130	127	2	0
Total	340	309	35	1

Notes:

1. The number of anomalies excavated that contained inert OE. Inert OE is defined as pieces of ordnance debris. Excavations containing more than one piece of inert OE were counted as one.
2. The number of anomalies excavated that contained UXO. UXO is defined as military munitions that have been prepared for action, and have been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard and remain unexploded. Any suspect item was treated as UXO.

At Site 5, approximately 6 acres of land were cleared of surface and subsurface OE to a depth of 4 feet during a 1997 Removal Action (CMS, 1997). A summary of the OE items encountered and removed during the removal action is presented in Table 3-3.

TABLE 3-3
1997 REMOVAL ACTION
OE ITEMS ENCOUNTERED AND REMOVED AT SITE 5

Item Description	Quantity	Depth (inches)
M51A5 fuze base	1	3
M51A5 fuze	6	1-8
60mm mortar tail boom with primer	2	1-24
Fuze booster	3	1-4
Projectile base fuze	1	2
Total	13	1-24

3.2.2 Site 8-Landfill Area, Former Wastewater Treatment Plant

Site 8 is currently owned by the University of Nebraska-Lincoln (UNL), and the property adjacent to this area is privately owned. Site 8 includes a former landfill and wastewater treatment plant. The site had been used for a landfill since the NOP was in operation. Historically, UNL used the area for the disposal of low-level radioactive and infectious waste (TCT, 1991). Operations at the landfill have ceased, and the landfill is capped with a soil and clay cover.

There have been allegations concerning the disposal of mustard agent (either by itself or contained in munitions) within the confines of the landfill in this area. A security fence was installed around the landfill in 1994. Groundwater monitoring wells were installed downgradient of Site 8 in 1992. Samples from these wells have found no detections of thiodiglycol, an indicator of CWM. An evaluation of historic interviews with former NOP and site personnel provide conflicting information regarding the suspected CWM burial. These interviews are included in Appendix C. The EE/CA stated that insufficient evidence and inaccurate documentation exists regarding the potential CWM burial and classified Site 8 as NDAI for OE. Based on the recurring review investigation, there is no new information to support the allegations that CWM was buried in the area.

3.2.3 Site 9-Proving Range

This site is currently a wildlife planting area owned by UNL. The site covers approximately 4 acres and was used by the DoD for proof testing of caps, fuzes, and boosters. No ordnance debris has been found during historic investigations at Site 9, however several small-denuded areas (2 feet x 6 feet) were found to contain small pieces of what appeared to be bulk explosives (TCT, 1991). During the EE/CA field investigation, surface clearance was conducted in three 100'x100' grids for geophysics at Site 9. Numerous pieces of metallic debris were located during the surface clearance, none of which were identified as OE. The EE/CA established NDAI for OE at Site 9. It was determined that the hazard and exposure risk posed by UXO at Site 9 is negligible; the probability of a mishap occurring with hazardous consequences is extremely improbable. The EE/CA concluded that in relation to current and imminent land use at the site, the risk of harm to the local populace and environment is negligible and does not warrant further action.

During the 1999 additional RI activities, 33 individual test pits and trenches were excavated in the area of Site 9 and no OE was detected in the excavations. A geophysical investigation was also conducted at this site as part of the 1999 RI. No OE was detected in that investigation. Approximately 160 cubic yards of Site 9 soil containing secondary explosives constituents was excavated and incinerated on-site in 1997 as part of OU-1 remedial action (OHM, 1998).

3.2.4 Site 10-North Burning Ground

Site 10 is currently a wildlife planting area owned by UNL. The site is approximately 5 acres in size and was historically described as an explosives burning ground. Site 10 may have contained

three large metal structures believed to be burn cages; however, there is no evidence of the former use of the land as a burning ground (Dames & Moore, 1996b). During the EE/CA field investigation, surface clearance was conducted in three 100'x100' grids for geophysics at Site 10. One piece of inert OE (spent booster cup) and numerous pieces of metallic debris were found during surface clearance activities. The EE/CA established NDAI for OE at Site 10. The hazard and exposure risk posed by UXO at Site 10 is negligible; the probability of a mishap occurring with hazardous consequences is extremely improbable. The EE/CA concluded that in relation to current and imminent land use at the site, the risk of harm to the local populace and environment is negligible and does not warrant further action.

During the 1999 additional RI activities, 2 individual test pits and trenches were excavated at Site 10 and no OE was detected in the excavations. A geophysical investigation was also conducted at this site as part of the 1999 RI (URS, 2000).

3.2.5 Potential Landfill Area

The potential landfill area is bordered by the NRD Reservoir to the east; Site 10 (North Burning Ground) to the west; Site 9 (Proving Grounds) to the south; and cropland to the north (see Drawing 2-1). Metal fence posts and other miscellaneous trash are visible along the exposed shoreline of the reservoir. A gate controls main access to Sites 9, 10, and the potential landfill area and UNL does not allow access to these areas.

In an area west of the NRD Reservoir, near the former landfill area, approximately 580 cubic yards of soil containing secondary explosives constituents was excavated and incinerated on-site as part of OU-1 remedial action (OHM, 1998).

During the 1999 investigation, 39 test pits were excavated in the area of the potential landfill area (URS, 2000). Construction debris and some OE scrap were discovered in the test pits. A geophysical investigation was also conducted at this site as part of the 1999 RI (URS, 2000). During that investigation, two fragments of incendiary bomblets were found along the western shore of the NRD reservoir when the reservoir was lowered to accommodate fieldwork (URS, 2000). The partial bomblets were subsequently destroyed in accordance with UXO policy and procedures (URS, 2000). Documentation of the finding and destruction of the partial bomblets is included in Appendix B. No other OE was discovered in that investigation.

Although the potential landfill area was not investigated as an individual site during the EE/CA, the area overlaps the Site 9 area EE/CA investigation. The EE/CA established NDAI for OE at Site 9. It was determined that the hazard and exposure risk posed by UXO at Site 9 is negligible; the probability of a mishap occurring with hazardous consequences is extremely improbable.

3.3 SITE VISIT

The project team conducted a site visit in October 2001 to visually confirm the physical condition of the site, and to verify current land use, site accessibility, and other factors affecting public exposure to ordnance risk. The team scheduled an open meeting and interviews with the

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local community members, community leaders, and regulators to solicit their comments and identify their concerns regarding OE response actions at the former NOP. Stakeholder meeting minutes and correspondence are presented in Appendix D. A summary of the site visit activities is presented in Appendix E.

The site visit was conducted to evaluate information in the following areas:

- Development at the site
- Erosion potential
- Recreation activities
- Fire
- Frost heave
- Changes in land use
- Changes in accessibility
- OE incidents
- Status of institutional controls
- Changes in stakeholder interest/concerns

It was anticipated that any new information not currently in the Administrative Record that was necessary to support the findings of the review would be discovered during the site visit and stakeholder meetings. A CENWO OE Safety Specialist developed an OE health and safety plan and directed the site visit. Areas of concern identified and observed by OE Recurring Review team members and EPA representatives include:

- Culvert Area (Site 5)
- Landfill Area, Former Wastewater Treatment Plant (Site 8)
- Proving Range (Site 9)
- North Burning Ground (Site 10)
- NRD Reservoir and Potential Landfill Area

These locations can be found in Drawing 2-1. Observations made during the site visit are included in Appendix E. Photographs taken during the site visit are included in Appendix F.

Site 6 (Turnout Area) and Site 12 (Bomb Booster Area) were included in the site visit due to EPA concerns about historic practices in these areas. Since the EE/CA classified these areas as NDAI for OE and no new information was found during this recurring review, these sites are eliminated from further evaluation in this report.

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3.3.1 Site 5-Culvert Area

During the site visit, the Culvert Area was inspected to review the status of the site with regard to the 1997 Response Action. At Site 5, the cattle pens, fencing, and gates serve as a barrier against foot and vehicular traffic (see Photo No. 1, Appendix F). There is no fencing in the location where the 1997 Removal Action took place (see Photo No. 2, Appendix F). UNL posted signs on trees in the area to warn of the potential for UXO (see Photo No. 3, Appendix F). Signage installed by UNL was not implemented or recommended by USACE. The feedlot pens in Site 5 are occasionally mowed by UNL, but no other activities are performed in the area.

3.3.2 Site 8- Landfill Area, Former Wastewater Treatment Plant

Site 8 was included in the site visit to investigate the suspected burial of CWM material in the landfill area. The EE/CA stated that there was insufficient evidence and inaccurate documentation related to the potential CWM burial and classified Site 8 as NDAI for OE. The mustard disposal area was not identified during the site visit. Groundwater monitoring wells were installed downgradient of Site 8 in 1992. Samples from these wells have found no detections of thiodiglycol, an indicator of CWM. An evaluation of historic interviews with former NOP and site personnel provide conflicting information regarding the suspected CWM burial. These interviews are included in Appendix C. Based on the recurring review investigation, there is no data to support the allegations that CWM was buried in the area. Photos of the former treatment plant and landfill area are included in Appendix F (Photos 7 through 12).

3.3.3 NRD Reservoir and Potential Landfill Area

The NRD Reservoir and Potential Landfill Area were inspected during the site visit to investigate the area where partially expended bomblets were discovered in 1999. A photo of a partial bomblet discovered in 1999 is included in Appendix F (Photo No. 16). During the site visit, the water level in the reservoir was down several feet due to dry seasonal conditions. Empty booster cups, an inert bomb fuze, and miscellaneous trash were discovered on the shore of the NRD reservoir in the potential landfill area (see Photos 17-20, Appendix F). Access to this area is controlled with a gate, however indications of recent entry by the public were noted during the site visit. UNL does not allow access to the area.

3.4 STAKEHOLDER AND REGULATOR INPUT

Stakeholders and regulators were notified of the OE Recurring Review in September 2001. A public notice was published in the local newspaper and letters were mailed to all stakeholders to inform them of the project and encourage them to attend the open meeting. An OE Recurring Review Plan was presented to regulators and stakeholders during the OE Recurring Review process. Regulators were asked to comment on the draft plan and stakeholders were provided with a copy of the plan at the interviews and open meeting. This section presents stakeholder concerns identified during the OE Recurring Review.

3.4.1 Regulator OE Concerns

EPA provided comments on the OE Recurring Review Plan, in which they identified concerns regarding the potential deficiencies in the documentation concerning ordnance issues at the former NOP. EPA conducted an evaluation of historic site OE documentation developed from 1983 to 1996. This evaluation and CENWK responses to EPA concerns are presented in Appendix G.

EPA representatives were present for two stakeholder meetings and the site visit. The minutes from the stakeholder meetings and site visit are presented in Appendices C and D, respectively. EPA expressed concern about recent discoveries of items that were not manufactured or used at the former NOP (e.g., partially expended bomblets). It was suggested during the site visit that materials may have been brought to the NOP for disposal from other locations, such as Offutt Air Force Base (AFB) in Bellevue, Nebraska, though this practice could not be substantiated. USACE was unable to contact Offutt AFB to review their historic records, however USACE does not expect that Offutt AFB would retain records from the period in question as most EOD records are destroyed after 3 years time.

EPA questioned whether Site 5 (Culvert Area) has been completely cleared in the past and EPA believes the potential for more shallow OE hazards at Site 5 exists. The EE/CA recommended surface clearance and subsurface clearance at Site 5 to a depth of 1 foot. This recommendation was based on land use. A six-acre portion of the site was cleared to 4 feet during the 1997 Removal Action. An evaluation of complete clearance at Site 5 was conducted during the EE/CA and found that technology limitations exist in detecting potential OE to 10 feet below the ground surface. Associated costs for complete clearance at Site 5 were also found to be prohibitive. Clearance area was determined based upon review of aerial photography, historical records of land use, and current land use.

The landfill area (Site 8) is a concern of EPA because it is the suspected burial area of CWM. Review of historic information has not substantiated this occurrence and downgradient monitoring wells have not detected breakdown products of CWM (thiodiglycol) in groundwater to date.

EPA also expressed concern regarding the 1999 discovery of two partially expended bomblets on the shore of the NRD reservoir. This occurred when the reservoir was lowered to accommodate fieldwork for the RI. The bomblet pieces (OE trash) were found in the vicinity of the potential landfill.

3.4.2 Stakeholder OE Concerns

UNL is a landowner of portions of the former NOP. During the stakeholder interviews, a meeting was held with the director of the ARDC. Meeting minutes are included in Appendix D. UNL expressed concern about specific areas where they have imposed their own restrictions on land use, including Site 5 (the Culvert Area), Site 9 (Proving Range), and former landfill areas. Specifically, UNL is concerned that Site 5 is not controlled with fencing and that not all geophysical anomalies identified at the site were excavated during past investigations (e.g., the

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EE/CA). UNL occasionally mows Site 5, but no other activities are conducted in the area due to self-imposed land use restrictions related to their interpretation of the Statement of Clearance issued for Site 5. The Statement of Clearance recommended a 6-acre parcel of land cleared during a 1997 removal action at Site 5 be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997). The Statement of Clearance did not impose any land use restrictions on the parcel. A summary of the geophysical field investigation results conducted during the EE/CA at Site 5 is included in Table 3-2 of this report. A summary of items encountered and removed during the 1997 Removal Action at Site 5 is presented in Table 3-3 of this report. UNL has imposed similar land use restrictions at Site 9 (Proving Range), and therefore does not maintain the area.

UNL is also concerned about access to the NRD reservoir where the partial bomblets were found exposed on the receding shoreline in 1999. As previously stated, this occurred when the reservoir was lowered to accommodate fieldwork for the RI. The bomblet pieces (OE trash) were found in the vicinity of the potential landfill.

Additionally, UNL raised concern about site accessibility, since the former NOP property is accessible to the public by state highway and county roads.

The Saunders County Board of Supervisors was interviewed during the recurring review. Meeting minutes are included in Appendix D. The county does not have record of any reported ordnance instances in recent years. Specifically, no instances have been reported on properties north of the former NOP. The county was not aware of any past or future land use changes in the area or at the former NOP.

The Saunders County Sheriff was contacted during this Recurring Review. The sheriff stated that his office has not received or responded to any UXO/OE calls related to the former NOP in recent years. The National Guard was contacted during this Recurring Review and according to their records they have not used live ordnance of 20-mm or greater during their occupation of former NOP property. No other stakeholders communicated OE-related concerns during the Recurring Review process.

This section presents an analysis of current protectiveness of OE response actions including changes in land use, accessibility, and technology that may affect the site; the status of institutional controls; and current protectiveness of the response actions previously implemented.

4.1 CHANGES IN LAND USE, ACCESSIBILITY, TECHNOLOGY

Stakeholders contacted during the OE Recurring Review did not reveal any recent or future land use changes at and around the former NOP. UNL indicated that no land use changes have been observed in the last five years, and that building demolition/debris removal conducted by USACE in the Load Lines Areas was the most activity that occurred at the site in recent years. According to UNL, there have been no changes on university property from agricultural use to either industrial use or residential use. There was no evidence or information indicating that land use changes occurred on property adjacent to the former NOP.

No accessibility changes were identified during the OE Recurring Review. UNL noted that the property is accessible to the public and is accessed by state highway and county roads.

UNL plans to expand their livestock feed operations starting in 2002. This expansion may involve earthwork and excavation in the Culvert Area (Site 5). Should such excavation be needed at Site 5 or other areas of concern, UNL plans to coordinate with CENWK prior to construction. Other site improvements planned by UNL include:

- Slab-on-grade small building construction (adjacent to Load Line 2)
- Sewage lagoon construction (in the Load Line 2 area)
- Decommissioning of the former Wastewater Treatment Plant (Site 8)
- Fencing upgrades (site-wide)
- Underground water and electric line installation (site-wide)
- Irrigation well upgrade (site-wide)

4.2 STATUS OF INSTITUTIONAL CONTROLS

Institutional controls are implemented to manage residual OE risk. DoD has not recommended institutional controls based upon risk at any location at the former NOP. UNL has constructed fencing and posted signage at various locations at the former NOP on their own accord. Fencing and signage are in place at Site 5 (Culvert Area), at Site 8 (Landfill Area, Former Wastewater Treatment Plant), at Site 9 (Proving Range), at Site 10 (North Burning Ground), at the Potential Landfill Area between Sites 9 and 10, and at Site 12 (Bomb Booster Area). The signs warn of the potential UXO in those areas.

4.3 REVIEW OF POTENTIAL SAFETY HAZARDS

Potential safety hazards were reviewed for Sites 5, 8, 9, 10, and the potential landfill area. A summary of this review is presented subsequently.

4.3.1 Site 5-Culvert Area

The hazard severity of existing feedlot operations at Site 5 is negligible for OE and the accident probability was determined to be unlikely since current operations are not expected to change. Should UNL plan excavations below 4 feet in the area, the hazard severity is expected to be marginal and a remote possibility exists that OE would be encountered during those excavations.

4.3.2 Site 8-Landfill Area, Former Wastewater Treatment Plant

The hazard severity of current land use at Site 8 is negligible for OE and the accident probability is classified as unlikely since no activities are currently conducted in the area. Should any investigations be conducted in the landfill, the hazard severity is expected to be marginal and the accident probability is expected to be seldom, or a remote possibility exists that OE would be encountered during any such investigations.

4.3.3 Site 9-Proving Range, Site 10-North Burning Ground, and Potential Landfill Area

The hazard severity of current land use at Sites 9, 10, and the potential landfill area is negligible for OE and the accident probability is unlikely since no activities are currently conducted in the area. Should surface activities be conducted in these areas, the hazard severity and accident probability would not change. Should subsurface activities be conducted in the area, the hazard severity would be negligible and the accident probability is expected to be seldom, or a remote possibility exists that OE would be encountered during any such subsurface activities.

4.4 REMOVAL ACTION PROTECTIVENESS

One removal action has been implemented to date at the former NOP. At Site 5, approximately 6 acres of land were cleared of surface and subsurface OE to a depth of 4 feet (CMS, 1997). In October 1997, a Statement of Clearance was signed by USACE, which recommended the cleared 6-acre parcel be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997). As stated in Section 3.0, the purpose of the OE Recurring Review is to evaluate the following:

- (1) Is the response action functioning as intended?
- (2) Are any assumptions used at the time of response action selection still valid?
- (3) Does new information indicate that the previously selected response is no longer protective of human health, safety, and the environment considering the best available technology?

The response action appears to be functioning as intended, as no OE-related discoveries at Site 5 were identified in the last five years. No land use changes were identified during this review, however it was noted that UNL plans to expand its cattle feedlot operation. The Statement of Clearance recommended a portion of Site 5 be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997), however it does not prevent UNL from using that area of the site.

The recommendations identified in the Action Memorandum were based on Site 5 data from previous actions, sampling results, surface and subsurface field investigations and an assessment of potential hazards and exposure risks to OE at Site 5 (Dames & Moore, 1996a). Since no new data has been identified for Site 5 during this recurring review, the assumptions stated in the Action Memorandum are still valid.

No new information was discovered during the recurring review that would indicate the previously selected response is no longer protective. Historic land practices at Site 5 may have brought OE objects to near surface in the past. There exists a potential for soil flotation of less dense objects, though no evidence of this was identified during the site visit. Although the potential for OE kickout exists around any of the OB/OD areas, no data was discovered during this recurring review to support this scenario. OE kickout is the random, accidental expulsion of an intact round out of a controlled area. No evidence was found that the public has been exposed to any intact live rounds at the former NOP in the past 40 years. At the time of this Recurring Review, the current response action at Site 5 was determined to be protective of human health, safety, and the environment.

The purpose of this OE Recurring Review is to determine whether the OE response action is expected to continue to be protective (USACE, May 2001). One removal action was conducted in 1997 at the former NOP, at Site 5 (Culvert Area). The protectiveness of the Site 5 removal action was analyzed as part of this recurring review and is discussed in Section 4.4 of this report. Site-specific conclusions are presented subsequently.

During the OE Recurring Review, no new information regarding the presence of OE was discovered and no land use or accessibility changes were identified at the NOP. No evidence was found that the public has been exposed to any intact live rounds at the former NOP in the past 40 years. Therefore, no known DoD-related OE hazards or wastes remain at the former NOP.

5.1 SITE-SPECIFIC CONCLUSIONS

The following sites were identified during the Recurring Review as possessing the most potential for residual OE:

- Site 5-Culvert Area
- Site 8-Landfill Area, Former Wastewater Treatment Plant
- Site 9-Proving Range
- Site 10-North Burning Ground
- Potential Landfill Area

5.1.1 Site 5-Culvert Area

At Site 5, approximately 6 acres of land were cleared of surface and subsurface OE to a depth of 4 feet (CMS, 1997). In October 1997, a Statement of Clearance was signed by USACE, which recommended the cleared 6-acre parcel be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997). A review of safety hazards revealed negligible risk and unlikely probability that an OE-related accident would occur under current operating conditions.

Existing fencing at Site 5 is used to control the movement of livestock and signs warn of potential UXO in the area. The signs were installed by UNL and were not recommended by DoD. Although the feedlot fencing is not specifically intended to keep UNL personnel and the public out of the Culvert Area, it is adequately protective for that purpose. UNL does not conduct activities other than feedlot operations and maintenance at Site 5.

The response action at Site 5 was evaluated to determine if it was still functioning as intended. Since no OE-related discoveries at Site 5 were identified in the last five years, it was determined that the response action is functioning as originally intended. No land use changes were identified during this review, however it was noted that UNL plans to expand its cattle feedlot operation, which may involve excavations to greater than 4 feet below ground surface. This

would conflict with the Statement of Clearance, which recommended a portion of Site 5 be used for any purposes that do not involve intrusive activities below 4 feet (USACE, 1997). If UNL expansion activities require excavation deeper than 4 feet, the current response action will need to be re-evaluated. All other assumptions used at the time of the response action selection were found to be valid.

No new information was discovered during the recurring review that indicates the previously selected response is no longer protective. The current response action remains protective.

5.1.2 Site 8-Landfill Area, Former Wastewater Treatment Plant

In 1994, a fence was installed around the landfill in the suspected CWM burial area at the request of UNL. The EE/CA stated that insufficient evidence and inaccurate documentation exists regarding the potential CWM burial and classified Site 8 as NDAI for OE. Site 8 was included in the Recurring Review as potentially containing residual OE based upon stakeholder concerns about CWM and the historic Interviews Relevant to the Presence of CWM at NOP (Appendix C). There is no documentation of the burial of CWM at Site 8, only personal accounts that could not be substantiated during the EE/CA process or during this recurring review. In addition, historic interviews regarding the CWM burial provide conflicting information. Sampling of downgradient groundwater monitoring wells has not detected thiodiglycol to date.

A review of safety hazards revealed negligible risk and unlikely probability that an OE-related accident would occur under current operating conditions. Results from previous evaluations and studies did not indicate risk at Site 8 and the EE/CA established NDAI for OE at Site 8. During this recurring review, no new information regarding the presence of CWM at Site 8 was discovered and no land use or accessibility changes were identified for this site. Site 8 does not pose a threat to the public and does not warrant further investigation for OE.

5.1.3 Site 9-Proving Range, Site 10-North Burning Ground, and Potential Landfill Area

No new information was identified for Sites 9 and 10 during this review. During the OE Recurring Review site visit, empty booster cups, an inert bomb fuze, and other miscellaneous trash were discovered on the shore of the NRD reservoir in the potential landfill area. These items were exposed on the receding shoreline of the reservoir, as the water level was low at the time of the Recurring Review site visit. These items are not a risk to the public since UNL does not allow access to the area.

The EE/CA established NDAI for OE at Site 9 and Site 10. It was determined that the hazard and exposure risk posed by UXO at Site 9 and Site 10 is negligible. Although the potential landfill area was not investigated as an individual site during the EE/CA, the area overlaps the Site 9 area EE/CA investigation. A review of safety hazards conducted as part of this recurring review revealed negligible risk and unlikely probability that an OE-related accident would occur under current operating conditions. Since no new information was identified for these sites

during the recurring review, these sites do not pose a threat to the public and do not warrant further investigation for OE.

5.2 NEXT OE RECURRING REVIEW

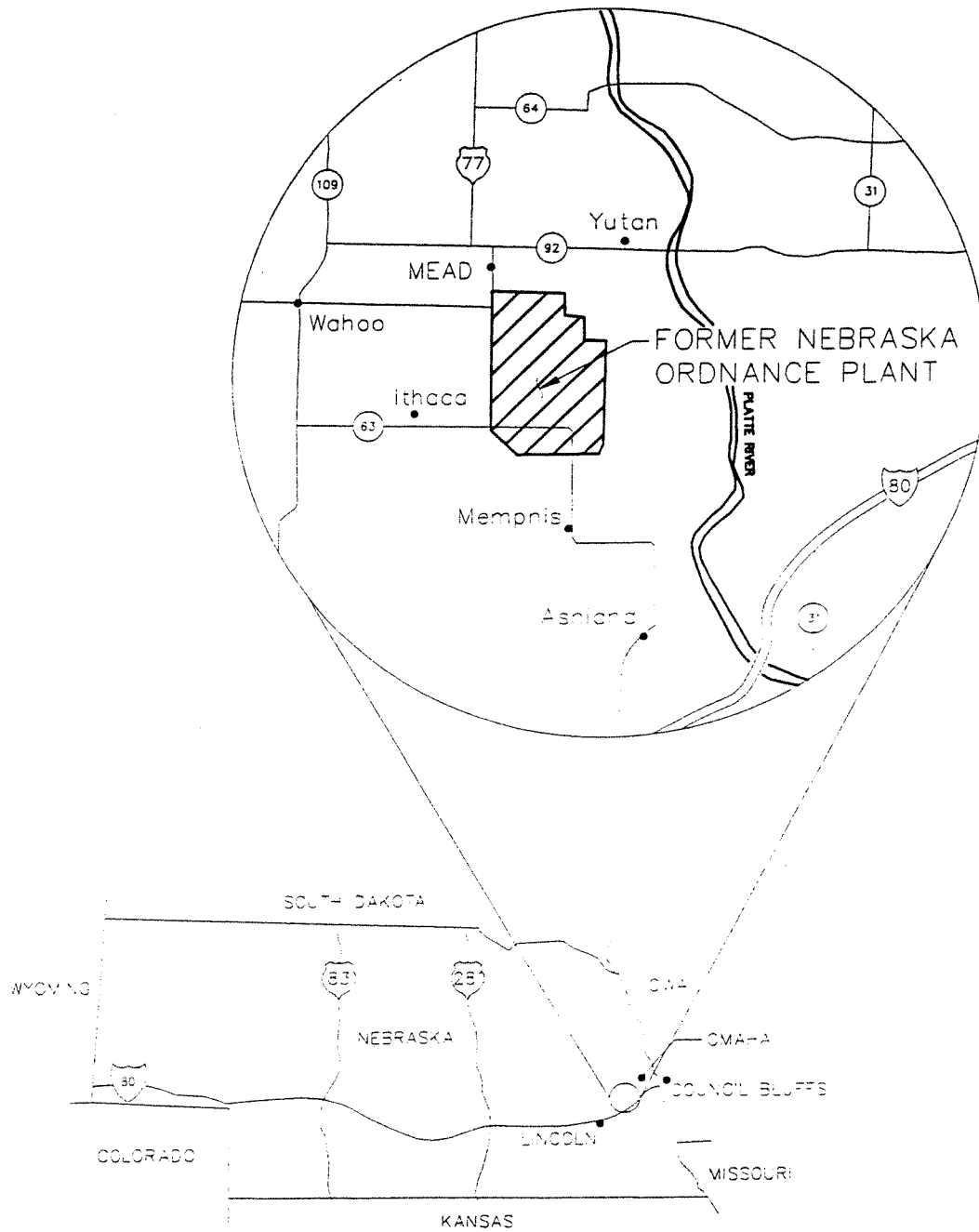
The next projected OE Recurring Review will occur in 2006. Should a problem with a response action be identified or should an incident occur before the next scheduled review in 2006, a request for an OE Recurring Review may be submitted to the CENWK office to have the response action reviewed. There are no anticipated modifications to the OE Recurring Review Plan or to the scope of work for subsequent OE Recurring Reviews.

SECTION 6

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DRAWINGS



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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by:

D.C.C.

Drawn by:

R.A.D.

Checked by:

A.C.E.

Submitted by:

L.A.T.



U.S. Army Corps
of Engineers

FMR, NEBRASKA ORDNANCE PLANT
MEAD, NEBRASKA

SITE LOCATION MAP

Scale: NONE

Date: AUGUST, 2001

Dwg. No.: 1-1

Figure
number:

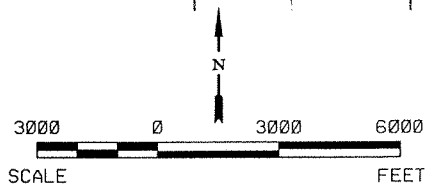
1-1



LEGEND:

- ① Load Line 1
- ② Load Line 2
- ③ Load Line 3
- ④ Load Line 4
- ⑤ Culvert Area
- ⑥ Turnout Area
- ⑦ South Burning Ground
- ⑧ Landfill Area - Former Treatment Plant
- ⑨ Proving Range
- ⑩ North Burning Ground
- ⑪ Detention Pond
- ⑫ Bomb Booster Area
- ▲ Potential Landfill Area (location where incendiary bomblets found)

— Former NOP Boundary



Revisions			
Symbol	Description	Date	Approved

URS Group Inc. 10975 El Monte, Suite 100 Overland Park, Kansas 66211		U.S. Army ENGINEER DISTRICT CORPS OF ENGINEERS KANSAS CITY, MISSOURI	
Designed by: S.J.F.		FMR, NEBRASKA ORDNANCE PLANT MEAD, NEBRASKA	
Drawn by: R.A.D.		U.S. Army Corps of Engineers	
Checked by: L.A.T.		LOCATION OF HISTORICAL SITES	
Submitted by: L.A.T.		Scale: 1 IN = 3,000 FT	Sheet number: 2-1
Date: NOVEMBER, 2001		Dwg. No.: 2-1	2-1

30 NOV 2001 10:14:37
J:\MEAD\N97209.DWG\08000-2-1.dgn

APPENDICES

APPENDIX A – List of Stakeholders

TABLE A-1
List of Stakeholders Notified of the OE Recurring Review
Former Nebraska Ordnance Plant (NOP), Mead, Nebraska

<u>Name</u>	<u>Organization</u>
Corinne Kay Moline	RAB Member
LeRoy E. Nelson	RAB Member
Katherine A. Saniuk	RAB Member
CFMO-E (Fritzscht)	Nebraska National Guard
Sue France	Lincoln Department of Water
John Miyoshi	Lower Platte North Natural Resource District
James E. Main	UNL Office of the Dir Business Services
Nate Mongan	RAB Member
Melissa Konecky	RAB Member
Ann Smith	Lower Platte South Natural Resource District
Judy M. Roots	UNL Office of General Counsel
Howard Isaacs	Nebraska Department of Health
Doris Karloff	Saunders County Board of Commissioners
Dan Duncan	UNL, Director UN-ARDC
Del Weed	UNL Hazardous Material Safety Office
Jerry O'Brist	Lincoln Water System
Subhash Jha	Nebraska Health and Human Services System
Larry Angle	Lower Platte North Natural Resource District
Ross Rasmussen	RAB Member
Ralph Martin	NDEQ
Craig Bernstein	U.S. EPA, Region VII
Jonathan Kahn	U.S. EPA, Region VII
Troy Bredenkamp	RAB Member
Mohinder Saini	CEMP-RF
Harold Kolb	
Doug Irvin	
Stan Keiser	
John Fertig	
Roger Allington	
Steve Frahm	
Bernard Hanson	

TABLE A-1
List of Stakeholders Notified of the OE Recurring Review
Former Nebraska Ordnance Plant (NOP), Mead, Nebraska

<u>Name</u>	<u>Organization</u>
Curtis Blum	
John Kirchmann	
Edward Kresak	
Agnus Kresak	
Edward Kresak	
Jim Welshons	
Lester Fox	
James Sutton	
Ken Kirchman	
Larry Heldt	
Cathi Wagner	
Janet Bonet	
Dorothy Lanphier	
Dennis Holm	
Kate Kachel	U.S. Army Reserve Center
Marilyn Larson	Village of Mead
Sue Dempsey	
Lisa Brichacek	Wahoo Newspaper
Ronald Poskochil	Saunders County Sheriff
Eldon Johnson	
Roger Koertner	Pathfinder Company
Richard McManaman	Former ARDC Facility Engineer

APPENDIX B – Documentation Relevant to Discovery of Partial Bomblets in 1999

774th ORDNANCE COMPANY (EOD)
FORT RILEY, KANSAS 66442
COMM (785) 239-3314
DSN: 856-3314
FAX: 856-2634

TO: _____ **FROM:** _____

COMMENT(S): _____

NUMBER OF PAGES(INCLUDING COVERSHEET) _____

EXPLOSIVE ORDNANCE INCIDENT REPORT

For use of this form, see FM 9-15; the proponent agency is US Army Training and Doctrine Command.

Incident Number:

774-70-99

Control Number:

079-165-99Unusual ☐Routine ☒

Reported: 30-Apr-99 05:00
 Departed Unit: 30-Apr-99 06:46
 Arrived Site: 30-Apr-99 10:30
 Depart Site: 30-Apr-99 12:30
 Arrived Unit: 30-Apr-99 16:30
 Travel Hours: 8.75
 Air Hours: 0.00
 Miles: 400
 Man Hours: 21.50
 Adjust Hours: 0

Incident Location:
 MRD RESAVOIR
 MEAD, NE (US)

Grid: PJ 18646033
 Latitude:
 Longitude:

Supported:

KANSA CITY DISTRICT CORPS OF ENGINEERS
 ED LOUIS
 700 FEDERAL BUILDING
 KANSAS CITY, MO

Phone: (816) 983-3563
 Other Contact:

Item(s) Reported:

1ea Incindlary Bomb

Personnel Dispatched

SSG Giuffre, Steve T.

SPC Rider, Christian C.

Ordnance Item(s) Identification and Disposition

Quantity:	UL:	Description / Fuze Condition / Lot Number	NEW (lbs):	Initial Disposition:	Final Disposition:
1	EA	4lb Bnc, M 128 (Armad) Lot Unknown	0		DISP BY DET
Total Net Explosive Weight (lbs):			0.00		

EXPLOSIVE ORDNANCE INCIDENT REPORTIncident Number: **774-70-99**

Narrative (Include all significant events and details)

EOD TM LEADER**EOD TEAM MEMBER****I CERTIFY THAT THE ABOVE LISTED DEMOLITION MATERIALS WERE CONSUMED.****NOTIFICATIONS****TIME OUT/PERS.****TIME IN/PERS.****79TH ORD BN.****937TH EOC.****GRID OF DISPOSAL.****POC FOR OFF POST DISPOSAL.****DD FORM 1926 (IED'S/COMM. EXPLOSIVES) USED.**

EXPLOSIVE ORDNANCE INCIDENT REPORTIncident Number: **774-70-99**

Categories:

- | | |
|--|---|
| <input type="checkbox"/> News Media Coverage | <input type="checkbox"/> Reserve Component Support |
| <input type="checkbox"/> Civil Law Enforcement | <input type="checkbox"/> Formerly Used Defense Site |
| <input type="checkbox"/> Chemical Response | <input type="checkbox"/> Injuries |
| <input type="checkbox"/> Nuclear Response | <input type="checkbox"/> Death(s) |
| <input type="checkbox"/> Transportation Accident | <input type="checkbox"/> Drug Related |
| <input type="checkbox"/> USACOE Supported | |

Threat:

- ☒ Imminent Threat
- ☐ Threat
- ☐ Extended Threat

SecDef Approval

☐ Yes☒ No

Demolition Materials Used:

DODIC:	Quantity:	UI:	Description / Lot Number:	NEW (lbs):	Total NEW (lbs):
M766 (1375-1671)	2	EA	IGNITER, TIME BLASTING FUSE M60 Lot SGK84C009-015	0.0001	0.0002
M131 (1375-2976)	2	EA	CAP, BLASTING NON-ELEC M7 Lot CIL-2-2A	1.4	2.8
M870 (1375-5248)	16	FT	FUSE, BLASTING TIME M700 Lot ENB82J007-002	0.00267	0.04272
M023 (1375-7040)	1	EA	CHG DEMO, M112 COMP C-4 Lot LOP94E025-001	1.25	1.25
Total Net Explosive Weight (lbs):				4.05	

Environmental Protection Agency Coordination:

Agency:

Person Contacted:

Phone:

Contact Date/Time:

Additional Information:

On-Site Disposal Approve ☐

Permit Granted:

EPA Permit #:

Signature of Unit Commander: (Record Copy Only)

CHRISTOPHER G. STRACK

Date:

INTERVIEW WITH LISA TRAVAGLIN, URS CORPORATION
DISCOVERY OF PARTIALLY EXPENDED BOMBLETS
13 NOVEMBER 2001

Subject: Remedial Investigation Activities (April – May 1999)
Former NOP – Mead, Nebraska

Lisa Travaglin was the site manager during the Remedial Investigation at the time the partial bomblets were discovered at the NRD reservoir. Ms. Travaglin stated that, on behalf of USACE, URS was conducting a Remedial Investigation (RI) in 1999 under Operable Unit No. 3 (OU-3) when the partially expended bomblets were discovered in potential landfill area. The purpose of the RI was to characterize contamination sources and migration at the OU-3 investigation areas, including Site 9 (Proving Grounds), the Potential Landfill Area near Site 9, Site 10 (North Burning Ground), and the NRD Reservoir.

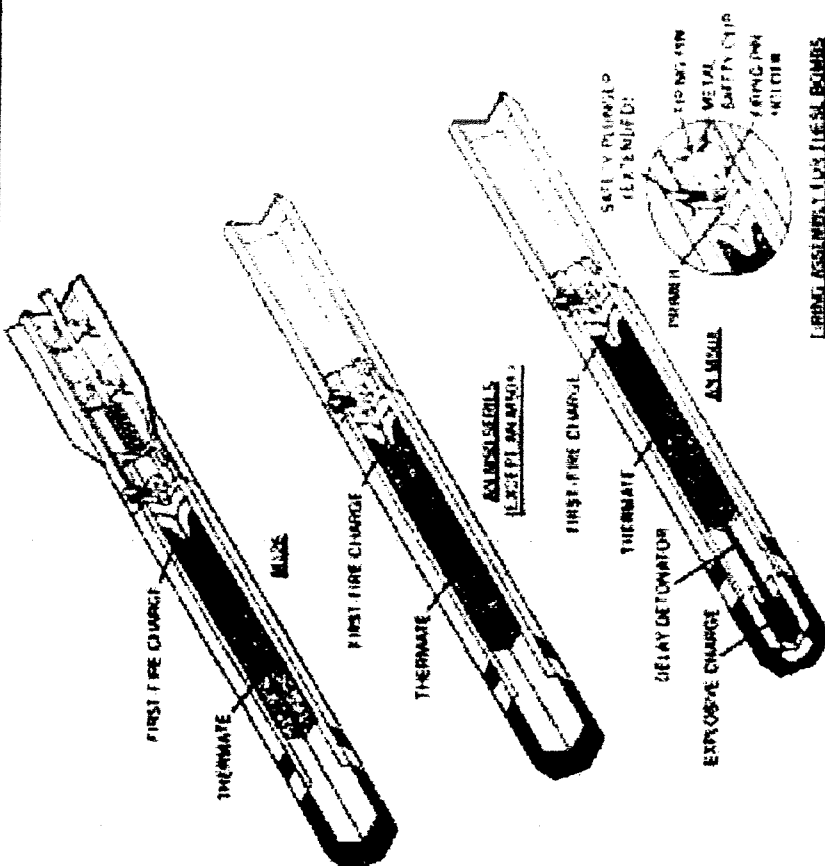
To accommodate the RI field activities, the NRD reservoir was drained. During the RI, URS completed daily surveys of the reservoir area subsurface as the water receded. The field personnel inspected the newly exposed subsurface each day to look for “suspicious” items, if any, that might have indicated the presence of raw product and UXO in the area.

During the daily survey on 28 April 1999, Ms. Travaglin noticed a portion of a bomblet on the receding shoreline on the west side of the NRD reservoir (within the boundaries of the potential landfill area). The daily field report cited it as a “partially expended 4-lb incendiary bomblet.” Ms. Travaglin reported the finding to the URS project manager, Rick Nusz, who in turn called the Corps of Engineers project manager Ed Louis. Mr. Louis then notified the 774th Ordnance Company (EOD) in Fort Riley, Kansas of the incident. On-site URS and UXO personnel secured the ground near the bomblet by placing flags around it and waited for EOD to arrive in response to the finding.

Prior to the arrival of EOD on the morning of 30 April 1999, a second partial bomblet was noticed on the newly exposed subsurface during the daily survey. It was reported and secured in the same manner as that of the first bomblet. EOD moved one of the partial bomblets and set it on top of the other and subsequently detonated the two bomblets (together) in place on the receding shoreline. No other bomblets were discovered during the remainder of the RI field activities.



1 U.S. BOMB, 4-POUND, INCENDIARY, AN-M50 SERIES, & M126



These are aerial dispensed impact-inertia fired, incendiary cluster bombs. The M126 bomb body is unpainted and the tail assembly may be painted gray, olive drab, or light red. The nomenclature, lot number, and color band are stenciled on the bomb body in light red. The AN-M50 series bombs are painted gray. If present identifying nomenclature is stenciled on the body in purple. A purple colored band is painted around the nose of the bomb. The bomb body is magnesium, the nose is cast iron, and the safety plunger and tail assembly are steel. The screw cap in the nose of the AN-M50X model is steel.

Country of Origin United States



43.00 mm



542.00 mm



1.60 kg

Explosive/Filler Type

Thermite

Net Explosive/Filler Weight

283.00 g



Do not transport



Disposal by detonation.

Cutaway View

APPENDIX C – Historic CWM Information and Interviews

FACT SHEET

US Army Corps of Engineers, Huntsville Division

September 29, 1993

Nebraska Ordnance Plant Formerly Used Defense Site *Suspect Munition Burial Site*

At the outbreak of World War II, the U.S. Government bought approximately 17,000 acres of land in Saunders County and built an explosives manufacturing facility, the Nebraska Ordnance Plant (NOP). Following the end of the Korean conflict in 1956, the NOP was declared "in excess". All property was transferred to the General Services Administration for disbursement. Approximately 1,000 acres were transferred to the U.S. Army for National Guard and Army Reserve training; 2,000 acres were given to the U.S. Air Force for use as a missile site; and 40 acres went to the Department of Commerce. In 1962, approximately 9,000 acres were purchased by the University of Nebraska for use as their Agricultural Research and Development Center. They purchased an additional 600 acres in 1964. The remaining property was eventually purchased by private individuals and corporations.

A small parcel of land at the site was used as a landfill. In 1972, during the construction of the Lower Platte North Natural Resources District impoundment dam, a former plant employee reported that six leaking 4.2 inch mortar shells (mustard filled) from a shipment through Offutt Air Force Base were buried in the landfill.

The Corps of Engineers Huntsville Division recently completed an extensive search through records, including incident reports, containing all chemical weapons/agent movements from 1945 through 1986. The records search did not confirm that chemical weapons/agent were moved through or to Offutt Air Force Base. Standard practice for shipping

chemical weapons/agent included Technical Escort Units responsible for handling and reporting any leaking munitions on an incident report. Burial of chemical agent by unauthorized personnel is not likely. The report of buried mustard agent in the landfill has not been confirmed.

A greenish gas was observed emanating from the ground in 1979 near the landfill by a University employee during landfill operations. The source of the greenish gas is not likely to have come from the mustard agent. Mustard Agent or "HD" freezes at approximately 58 degrees Fahrenheit. It has an extremely low vapor pressure. The term "Mustard Gas" is not an accurate description because gases are normally associated with higher vapor pressures.

If the assumption is made that the munitions do exist, there is still little reason for alarm. A 4.2 inch mortar configured to detonate consists of the filled casing, burster, and fuse. The fuse is required to detonate the burster. Munitions were **not** shipped in a fused configuration. As a further precaution, it was standard practice to remove the burster prior to disposal.

Given the above information and the fact that the suspect rounds are buried in a landfill, and would be extremely difficult to locate, the best course of action would be to close the landfill as planned and occasionally analyze samples taken from existing wells for the mustard breakdown product: thiodiglycol.

Huntsville Division is the Army Corps of Engineer's center of expertise for ordnance and explosive wastes.

**- INTERVIEWS RELEVANT TO THE PRESENCE
OF CWM AT NOP**

**Telephone Interview with Mr. Joe Vculek, Saunders County Historical Society.
August 23, 1993.**

Mr. Vculek stated that the Historical Society did not have very much information on the former NOP. He stated that we should talk to Harry Berman. Mr. Vculek also said that the County Museum was under construction and that he did not have time to talk with us.

**Interview with Mr. Tom Sladak, Chief Warrant Officer, Support Maintenance Center (SMC), Nebraska National Guard.
August 24, 1993.**

Mr. Sladak has been associated with the SMC since 1964. In that time he has no recollection of ever seeing anything buried. He has no former NOP records or facility maps.

He has knows of no stories or rumors of any buried materials on the former NOP. He also stated that he knows of no areas of stressed vegetation.

Mr. Sladak has not heard of any reports of chemical ordnance being disposed of at the former NOP.

**Interview with Mr. Chick Hastert former Civilian in Charge of the former Nebraska Ordnance Plant.
August 24, 1993.**

Mr. Hastert, a chemical engineer, worked at NOP from 1941 until its closure in 1956. After NOP closed he continued to work on site as an employee of the University of Nebraska, as the Facility Manager. During his years at NOP he held many positions including Head of Ammunition Inspection/Quality Control and Civilian in Charge (CIC). He was also a member of the Ammunition Subcommittee,* which met periodically to discuss issues and problems occurring at ordnance plants throughout the nation.

The operations of NOP were discussed, which included ordnance type and production techniques. NOP produced 12,000 and 10,000 pound bombs. To increase the production and quality of the pouring operations of the large bombs a technique known as scrap pouring was used. Scrap pouring was accomplished by first pouring molten TNT (or other high explosive) into square pans that resembled large cake pans, approximately 24" by 24" by 4" high. After the TNT had to cooled and hardened it was removed from the pans and broken into chunks (2" to 4" diameter) with a mallet. The broken chunks of TNT were known as "scrap". The scrap was placed into the bomb bodies by hand, until the bomb cavity was nearly full, molten TNT was then poured in to the bomb to fill the voids between the scrap. A rod was used to stir the explosive filling, to remove any cavities. The final procedure was accomplished using a bucket of molten TNT to "top off" the bomb.

**INTERVIEWS RELEVANT TO THE PRESENCE
OF CWM AT NOP
(Continued)**

The Demolition Area was used to blow up boosters and detonators, etc. after the plant had shut down. The T-shaped culverts were used as a site to destroy boosters; 2 or 3 were placed in the culvert and detonated. The Demolition Area was used for approximately 3 months.

After NOP was shut down the bombs were sent to Aneston, Alabama.

The boosters that were produced at NOP were filled with Tetryl pellets.

The North Burning Ground contained cages that were used to burn the empty cardboard TNT containers. This area was never used to burn any explosive residues.

The South Burning Ground (BG) was used to burn waste TNT. The TNT was placed upon the ground and ignited. The So. BG was owned by the Air Force. The TNT from the clean-out of the sumps and ditches was also burned at the So. BG.

Trenches were used for the burning of inert material.

Mr. Hastert discussed the disposal of the CWM at NOP. He stated that the incident was a little hazy in his memory. At the time of the disposal he thought the incident to be a minor item, barely worthy of remembering. To the best of his memory the incident occurred as stated: Around 1960, two or three military personnel showed up at the NOP with 5 or 6 canisters containing mustard gas. The size of the canisters was about two feet long and 3 to 4 inches in diameter. The "soldiers" said that they had some items that were leaking mustard and they needed somewhere to bury them. Mr. Hastert took the soldiers to the landfill near the STP and instructed them to bury the canisters within the landfill at the foot of the cliff. The soldiers used a shovel to dig a hole and bury the canisters at the base of the cliff. The incident was then forgotten for several years until the Natural Resources District (NRD) began drilling geotechnical borings prior to the construction of a dam. When Mr. Hastert observed the drilling operations he warned the drillers of the possibility of encountering the buried mustard. The drillers moved away from the landfill. [NRD logs indicate that the drilling was performed in Nov. and Dec. 1972 and March and April 1973].

Mr Hastert stated that there was an understanding between NOP and Offutt AFB regarding the disposal of Offutt items.

Other items discussed:

Dredging operations on the Missouri River brought up some bombs along with the river sediments. Mr. Hastert was brought to the dredge to identify the bombs. They were identified as dummy bombs that were produced at NOP and dropped in the River during training missions flown out of Offutt AFB.

**- INTERVIEWS RELEVANT TO THE PRESENCE
OF CWM AT NOP
(Continued)**

Two experimental 40,000 pound bombs were loaded with plaster of paris and sent to a Naval Ammunition Depot in California. Years later, after the bombs were discovered at the depot, a nervous depot commander requested Mr. Hastert to be sent to California to identify the items.

Nike warheads were loaded at the facility during the final year of NOP.

NOP also loaded 105mm howitzers and practice rockets during the Korean War.

There are no explosives buried at the landfill.

Mr. Hastert stated that he had single handedly disposed of the NOP and converted the plant to be used by the University.

End of interview.

On June 28, 1993 Thomas Lachajczyk of TCT-St. Louis contacted Mr. John Jurgiel (878-8666) by telephone to discuss his knowledge concerning disposal of mustard canisters at Offutt AFB in 1960. Mr. Jurgiel provided the following information.

1. Mr. Jurgiel was a Second Lieutenant and Safety officer in the USAF.
2. Metal canisters, approximately 12 to 18 inches in length and 4 to 5 inches in diameter were sent from an unidentified Reserve Unit Site in Omaha to Offutt AFB for disposal. They were assumed to be recyclable metal and were shipped to a scrap iron works in Omaha. The scrap iron works returned them to Offutt because some of the items were suspected to be leaking chemical warfare agents. These cylinders may have been training devices.
3. Mr. Jurgiel stated he responded to the Base Disaster Control Office's request for assistance on October 6, 1960. He stated that there were about eight cylinders in total and that about two had visible leakage of liquid. He donned protective clothing and was assisted by an airman and a sergeant.

He said he used a test kit (e.g., test paper) to verify the leaking material was mustard gas. The cylinders were secured in plastic and placed in 55-gallon drum(s). This took about two hours. He said one or two drums were used. It was not his responsibility to arrange for disposal. As far as he could recall, the drums were retained on-site "for about a month" until proper disposal could be arranged.

4. Mr. Jurgiel stated he was told the drums were taken to an Army Permanent Burial facility in Nebraska. He did not know the specific location.

**- INTERVIEWS RELEVANT TO THE PRESENCE
OF CWM AT NOP
(Continued)**

5. Mr. Jurgiel received a letter of commendation from Major Vincent J. Mankowski, Offutt AFB Disaster Control Section, for his role in handling this situation.

**Interviews with Richard "Mac" McManamen, Facilities Manager of the University of Nebraska, Agricultural Research and Development Center (ARDC).
July 22, 1993 and August 23, 1993**

Telephone Interview, July 22, 1993

Mac stated that to his understanding there was ordnance containing mustard gas buried at the Solid waste site (Landfill). It was reported to him that there were ordnance containing mustard gas being shipped by airplane to Offutt AFB, and that some of the items began to leak. The leaking items were brought to NOP and buried in the landfill.

Mac said that Mr. Chick Hastert (former Facilities Manager) should be contacted because he was a witness to the burial of the leaking ordnance. Mr. Hastert is now retired and lives in Wahoo.

An excavation contractor who was digging in the landfill (ca 1980) reported to Mac that he thought he had hit a gas line. Mac returned to the excavation with the contractor and observed a greenish yellow-colored gas which he thought looked similar to chlorine gas. The gas was discoloring the soils to dark green. Mac stated that he could show us where the excavation site was.

He also mentioned that there have been 2 or 3 other environmental firms investigating the site, some had even performed borings. Nothing has been found during the investigations that would indicate the presence of chemical weapons at the landfill.

Personal Interview. August 23, 1993

Mac stated that there were six canisters buried at the landfill in Section 19, near the sewer plant. Chick Hastert should be contacted because he was on site when the incident occurred.

Mac said that when he had just began to work for the University, (Oct. 1979) his first task was to fix up the landfill. He hired a contractor (Ruzisk of Wahoo) to excavate new trenches in the landfill. While the contractor was digging a trench (8 to 12 feet deep) he encountered a odor that made him believe that he had hit a gas line. The backhoe operator reported to Mac and he investigated the excavation. He observed a greenish colored gas that turned the soil green that reminded him of chlorine gas. Mac directed the operator to backfill the excavation and dig in another location. Mac does not know what the substance encountered was, he doesn't recall what the odor was like, but the gas reminded him of Chlorine gas he was exposed to in Army basic training.

**INTERVIEWS RELEVANT TO THE PRESENCE
OF CWM AT NOP
(Continued)**

The landfill is currently closed.

Discussed the Sewage Treatment Plant (STP), which is a gravity flow system with an Imhoff tank. The discharge is into the creek, at one time there was a trickle filter but the filter is by-passed now. Only half of the capacity of the STP is used. The University plans to abandon the STP by the year 2000.

The only UXO that he has found on-site was the 3.5" practice rockets found in the change house and some propellant grains (1 to 1.5" long) which were found at the North Burning Ground.

Dan Duncan, Director/Superintendent of ARDC and Mac's supervisor, came into the meeting. We also discussed the issues with him.

Apparently the State of Nebraska is very concerned about the possibility of mustard gas being present in the landfill which is on State property. The State is concerned about the liability issues related to a possible mustard gas exposure of civilians who may walk across the landfill.

Other contacts: Chick Hastert, Pat Paterson (died), John Cichelli and Kathy Older of the KC COE, Saunders Co. Historical Society (George Vculek 443-4719), Harry and Twila Berman in Wahoo.

Mac does not believe that there are bomb demolition craters in Section 35 at the turn out and culvert areas. He believes that they are sand blow-outs.

In Section 20 there are two old homesteads.

He stated that a neighbor of the former NOP, Mr Lirchman, filed suit against the Government. The suit was reported to be over the TCE contamination of the groundwater.

Field team reviewed original NOP maps from Mac's files.

Mac provided the field team with a copy of an aerial photograph in which he indicated the approximate location of the 1979 excavation.

On October 20, 1993 Mr. John Jurgiel called Thomas Lachajczyk of TCT to comment on the photos sent to him for review. Mr. Jurgiel was able to identify the canisters he over packed as being either "Toxic Gas Set, M-1" or the "War Gas ID Set, M-1".

1. He stated that the items shown in the photo in the upper left hand corner look just like the items he helped to containerize when he was a Safety Officer at Offutt Air Force Base in 1960. His comment was, "You found the containers!" Mr. Jurgiel said the containers also resembled those shown in the picture in the upper right hand corner, but there was no box.
2. He recalls two to four "long cylinders". He believes each cylinder contained approximately five, or possibly six, "smaller canisters." He could not recall the exact number of long or smaller containers.
3. Some of the "smaller canisters" were removed from the "long cylinders" and were labeled "mustard", and/or "toxic gas kit".
4. He did not look at all of the "smaller canisters" but believes they were all identical.
5. The source of the containers was reported to be an Army Reserve unit in Omaha.
6. The containers were leaking, and so they were taken to the nearest major military base, which happened to be Offutt Air Force Base.
7. The items arrived on a Friday and nothing was done with them at that time.
8. By Monday morning the items had released a characteristic odor into the building where they had been stored over the weekend. Due to this odor it was assumed at least some of the canisters had significant leaks. He could not verify or recall the specific odor, eg., the odor of freshly cut hay.
9. The items were immediately taken outside by Mr. Jurgiel and an assistant. The smaller canisters were re-placed in the longer cylinders. They were put in one or two plastic bags. They were then placed in one or two 55 gallon drums. He could not recall with certainty the number of drums used.
10. A week later, he was told the drum(s) were being taken to a "permanent Army burial facility", believed to be in Nebraska.
11. It was common knowledge at Offutt that an incident involving receipt of leaking mustard containers had occurred.

Telephone interview with Richard "Mac" McManamen, Facilities Manager of the University of Nebraska, Agricultural Research and Development Center (ARDC).
October 25, 1993

The subject of the interview was the October 19, 1993 letter that was sent to Mr. McManamen. The letter contained color photographs of chemical weapons identification and training kits. Mr. McManamen was asked if he had ever encountered any items that resembled the items in the photographs.

Mr. McManamen stated that "I have not seen anything like that" on the NOP. He also said that he would show the photographs to the other long term ARDC employees.

CLARIFICATION CONCERNING LOCATION OF DISPOSAL OF MUSTARD VIALS MEAD NEBRASKA

In response to a telephone request from Mike Dace, Paul Shetley and Tom Lachajczyk of TCT contacted the following individuals:

1. Mr. Mac Macmanamon: He stated that Figure 3-1 in our draft report was inaccurate. He has sent us a marked-up map. The University's state-approved landfill is directly west of the wastewater treatment plant, south of the area labeled "landfill" and south of the cliff line. The University's approved landfill, which is rectangular and consisted of eight cells, is not shown or labeled in Figure 3-1, and was not specifically described in the text.

The area labeled "landfill" in Figure 3-1 is actually an unapproved dump site which has been in use for many years. It was used by the NOP, farmers, and University of Nebraska. It contains lots of visible trash. Property ownership in the unapproved dumpsite is vague and includes the North Platte Natural Resources District as well as the University of Nebraska.

The University's approved landfill is in the process of being closed. The Corps has requested the University to fence its approved landfill as part of the closure because of the reported disposal of Mustard. The University's approved landfill is the site of the release of a "green cloud" during excavations in 1979. Due to this incident the belief that mustard was present in this landfill has continued. As indicated in our report, mustard would not form a green cloud. The University does not feel their landfill should be fenced because it is not the Mustard disposal area.

2. Mr. Chick Hastert. He stated that the disposal area he witnessed was in the flood plain, below and north of the base of the cliff line. It was not "up top", where the University's approved landfill is located. It was not at or near the North Burning Ground. He recalled that the canisters buried were not the size of drums. He could not definitely identify them as any of the pictured items sent to him by TCT about one month ago.
3. Mr. Chuck Twing. (205-955-4584) He had been unaware of the presence of the University's approved landfill. We explained that Mr. Macmanamon had in the past identified the location where the green cloud was released as the location of buried mustard. We explained that Mr. Hastert stated the mustard was buried north of the cliff line. Chuck wants us to contact Tech escort at Edgewood Arsenal (Jeff Smart) to determine if there is record of shipment of CWM to or through Mead around 1960.

TCT had contacted Tech Escort during the Archives Search but there was no information found. We have requested a computerized search as of their files on Dec 2, 1993.

TCT - St. Louis

Consulting Engineers, Scientists and Analytical Services

1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114-5700
Phone (314) 426-0880
Fax (314) 426-4212

October 19, 1993
9392

Mr. Richard McManamen
Facilities Manager
University of Nebraska
Agricultural R & D Center
Post Office Box 163
Mead, Nebraska 68041

Dear Mr. McManamen:

Attached is a copy of photographs of four examples of military Chemical Weapons Identification and Training Sets. These photographs depict items that could have been disposed of at the former Nebraska Ordnance Plant (NOP) or that could have been involved in the chemical weapons disposal incident that was reported to have occurred around 1960.

Could you please review these photographs and let us know if you have seen any of these items at the former NOP.

After you have reviewed these photographs would you please contact Nancy Dickens or me with your comments at 1-800-377-7344.

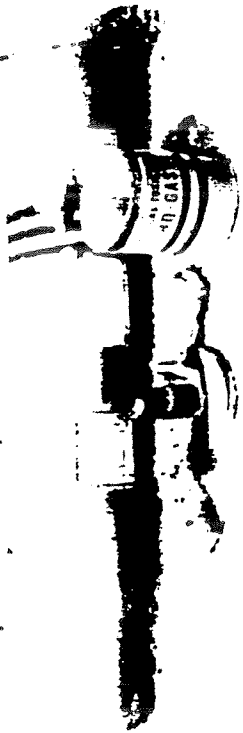
Sincerely



Paul W. Shetley
Environmental Scientist

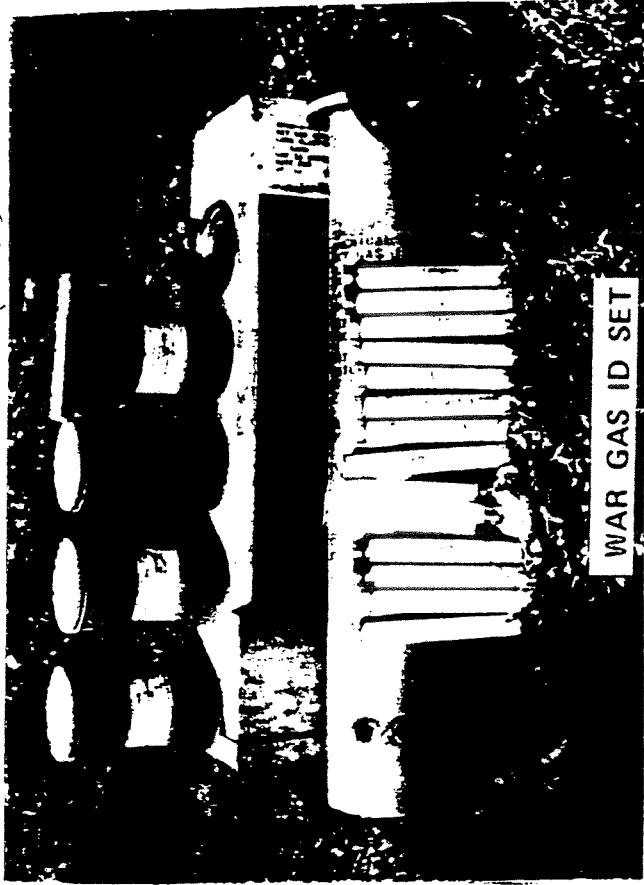
PWS/jam/PWS211/n

Size: 38" X 6.5"

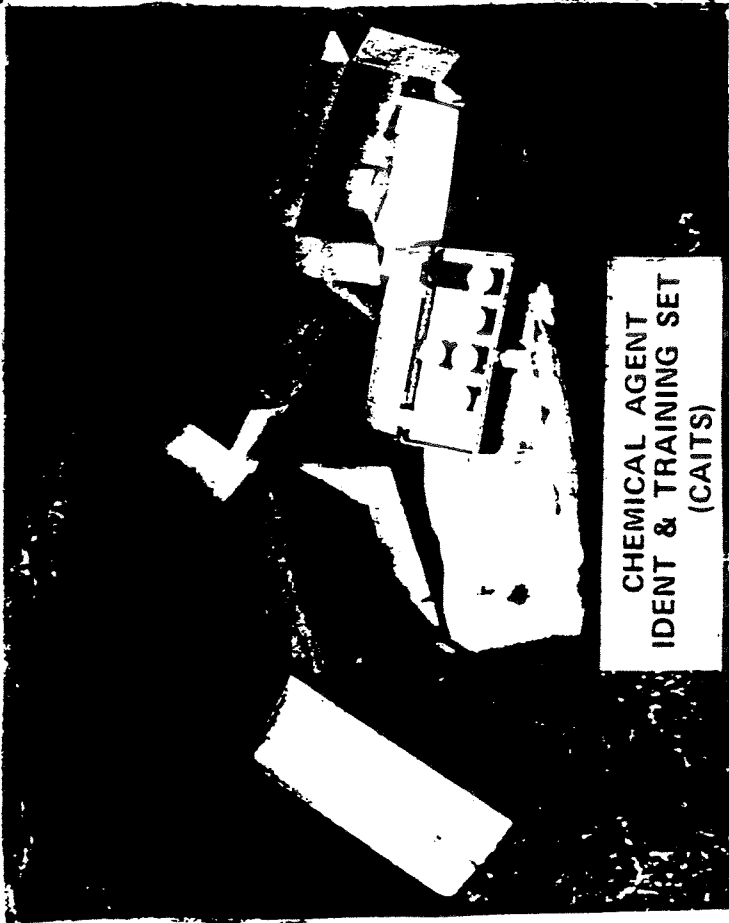


TOXIC GAS SET

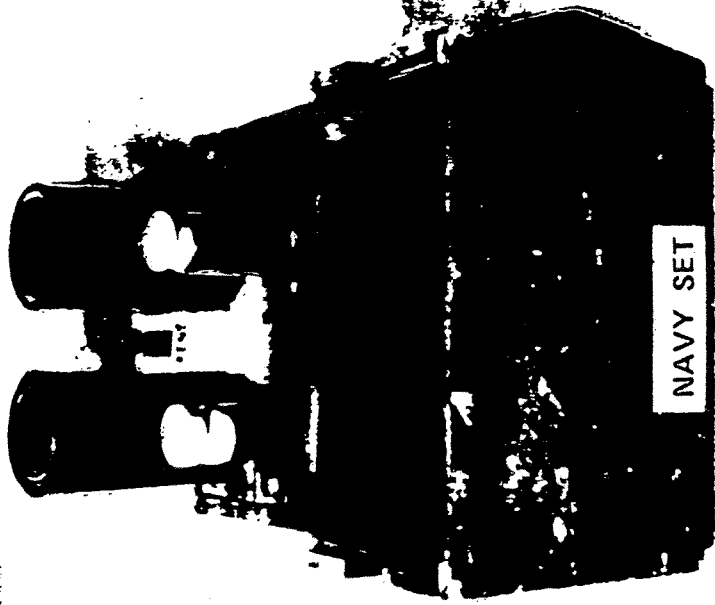
Size: 38" X 6.5"



WAR GAS ID SET



CHEMICAL AGENT
IDENT & TRAINING SET
(CAITS)



NAVY SET

IDENTIFICATION AND TRAINING SETS

TCT - St. Louis

Consulting Engineers, Scientists and Analytical Services

1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114-5700
Phone (314) 426-0880
Fax (314) 426-4212

October 19, 1993
9392

Mr. F. C. Hastert
858 N. Broadway
Wahoo, Nebraska 68066

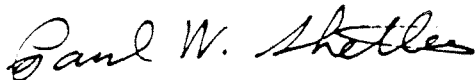
Dear Mr. Hastert:

Attached is a copy of photographs of four examples of military Chemical Weapons Identification and Training Sets. These photographs depict items that could have been disposed of at the former Nebraska Ordnance Plant (NOP) or that could have been involved in the chemical weapons disposal incident that was reported to have occurred around 1960.

Could you please review these photographs and let us know if you have seen any of these items at the former NOP.

After you have reviewed these photographs would you please contact Nancy Dickens or me with your comments at 1-800-377-7344.

Sincerely



Paul W. Shetley
Environmental Scientist

PWS/jam/PWS211/n

TCT - St. Louis

Consulting Engineers, Scientists and Analytical Services

1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114-5700
Phone (314) 426-0880
Fax (314) 426-4212

October 19, 1993
9392

Mr. John Jurgiel
Jurgiel & Associates
1819 Craig Road
Suite 207
St. Louis, Missouri 63146

Dear Mr. Jurgiel:

Attached is a copy of photographs of four examples of military Chemical Weapons Identification and Training Sets. These photographs depict items that could have been disposed of at the former Nebraska Ordnance Plant (NOP) or that could have been involved in the chemical weapons disposal incident that was reported to have occurred around 1960.

Could you please review these photographs and let us know if any of these items appear similar to the items disposed of by you while stationed at Offutt Air Force Base.

After you have reviewed these photographs would you please contact Nancy Dickens or me with your comments at 1-800-377-7344.

Sincerely



Paul W. Shetley
Environmental Scientist

PWS/jam/PWS212/n

TCT - St. Louis

Consulting Engineers, Scientists and Analytical Services

1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114-5700
Phone (314) 426-0880
Fax (314) 426-4212

October 20, 1993
9392

Mr. Thomas Murrell
U.S. Army Corps of Engineers
Attn: CELMS-PM-M
1222 Spruce Street
St. Louis, Missouri 63103-2833

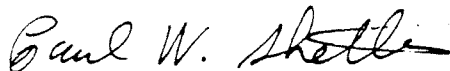
Dear Mr. Murrell:

Attached are the copies of the letters that were sent to F.C. Hastert, Richard McManamen, and John Jurgiel regarding the review of the photographs of the Chemical Weapons Identification and Training Sets. The letters and copies of the photographs were mailed on October 19, 1993.

TCT will forward their replies to you upon receipt.

If you have any questions, please contact Nancy Dickens or me at (314) 426-0880.

Sincerely,



Paul W. Shetley
Environmental Scientist

PWS/jam/PWS213/n

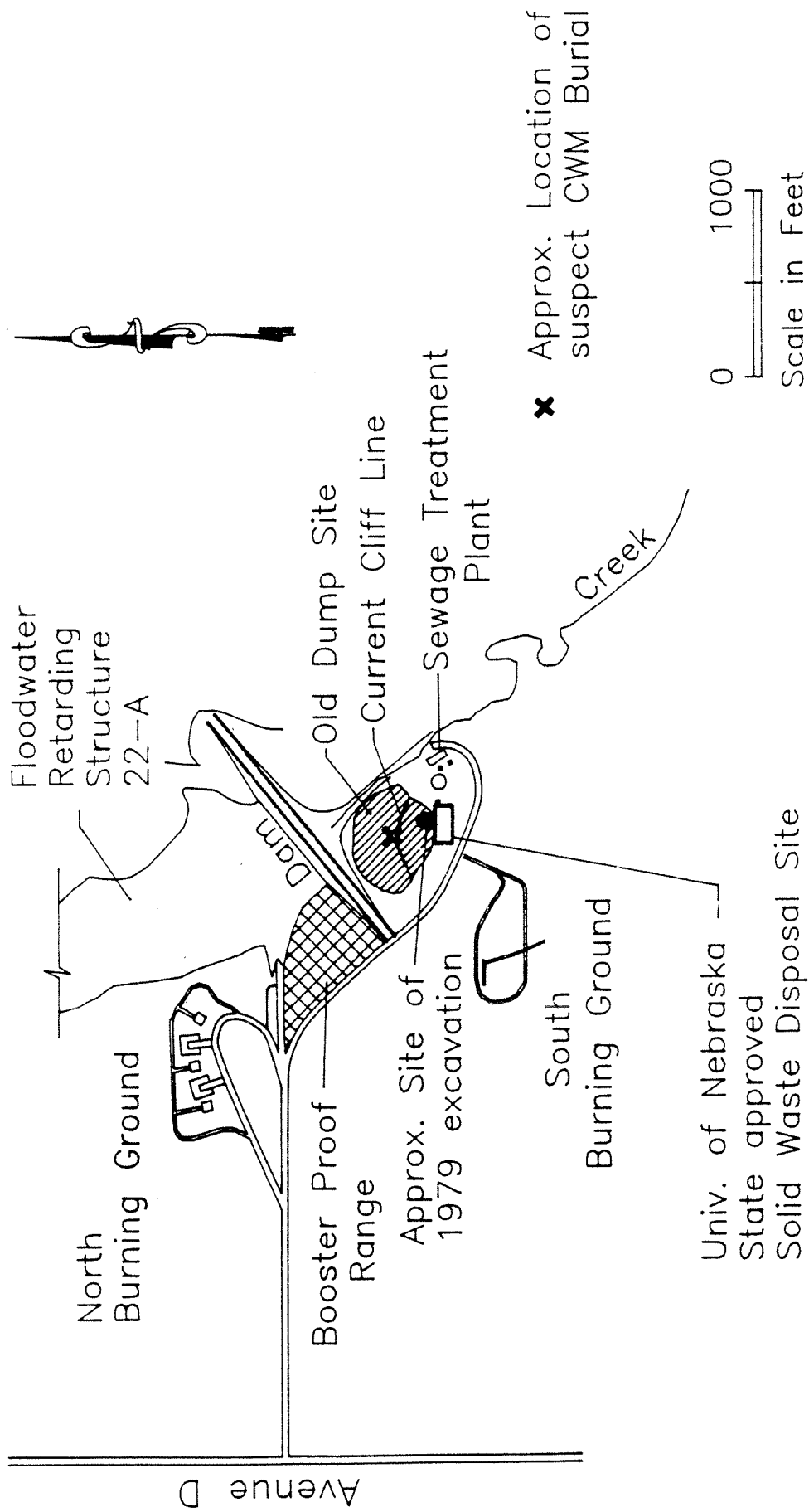


Figure 3-1

Huntingdon
TCT
 St. Louis

**Sites Relevant to the Reported Disposal
 of CWM at the Former Nebraska Ordnance Plant
 Mead, Nebraska**

Project No.	9392
By:	<i>JH</i>
Chk'd By:	<i>TZ</i>
Date:	12-6-93

APPENDIX D – Stakeholder Meeting Minutes/Correspondence



DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896

October 15, 2001

MEAD OE RECURRING REVIEW MEETING MINUTES

INTERVIEW: Dan Duncan – University of Nebraska Agricultural Research & Development Center (ARDC)

Date/Time: 10 October 2001/1600 to 1730 hrs

Place: ARDC Building, Mead, Nebraska

File: Former Nebraska Ordnance Plant (NOP) – Mead, Nebraska

Purpose of Meeting:

Allow interested stakeholders to relate incidents or concerns regarding OE at the former NOP.

Attendees:

Dan Duncan	University of Nebraska-Lincoln (UNL) ARDC
Craig Bernstein	USEPA, Region VII
Tom Lorenz	USEPA, Region VII
Fred Molloy	TechLaw, Inc.
Mary Budny	CENWK
Charles Colbert	CENWK
Tom Graff	CENWK
Brad Lasater	CENWO

- Introduction and welcome by Tom Graff
- Mary Budny distributed copies of interview questionnaire and OE Recurring Review Plan to facilitate meeting
- Craig Bernstein of EPA asked about the comprehensiveness of the Engineering Evaluation/Cost Analysis (EE/CA) for the former NOP. Brad Lasater, CENWO, stated that the EE/CA was more specific to sites where ordnance was expected and that [it is assumed] a site-wide EE/CA was not completed for the former NOP (*NOTE: this was found to be an incorrect statement. The EE/CA covers the entire site and areas that were not specifically address should be classified as No DoD Action Indicated.*) Brad also stated that the NOP was active from the period during WWII and through the Korean conflict and was demilitarized in 1958.

INTERVIEW MINUTES: Dan Duncan – UNL ARDC

- Question 1: *Describe any changes in land use in the last 5 years at the former NOP site.*

Dan Duncan, UNL ARDC, stated:

- There have been no land use changes on the UNL property where ordnance was found or expected. Specifically, there have been no land use changes in the culvert area (site 5) or at the proving ground (site 9). UNL controls 9600 acres of the former NOP 17,000 acres. Areas where buildings stood (e.g. load line areas) have been converted to farmland,.
 - Building demolition/debris removal (BD/DR) by the USACE has occurred in the load line areas in recent years (1997) to 4 feet below ground surface (bgs).
 - There have been no changes on the site from agricultural use to either industrial or residential use.
 - There have been some buildings torn down and land is now used for agricultural purposes (industry to agriculture).
 - The former magazines used for storage have been torn down and the area is now used for agricultural purposes.
- Question 2: *Describe any changes in land use in the last 5 years on the property adjacent to the former NOP site.*

Dan Duncan, UNL ARDC, stated:

- USACE Remedial Action (RA) activities have been conducted on UNL property. An irrigation pipeline has recently been constructed, presumably below the frostline (*according to the Nebraska NRCS, the frostline in the area is estimated to be 3-4 feet*).
 - Dan is unaware of any changes on property to the north of the former NOP.
- Craig Bernstein, EPA, asked about future land use changes on UNL property.

Dan Duncan, UNL ARDC, stated:

- UNL is looking to expand feed operations on the property, including the cattle feed lot near the culvert area (site 5).
- A letter from USACE Kansas City District (Josephine Newton-Lund) dated 1996 stated that the culvert area (site 5) was excavated to 4 feet below ground surface (bgs) and UNL may ask USACE if they would like to pursue future construction in that area.

INTERVIEW MINUTES: Dan Duncan – UNL ARDC

- Feedlot construction may involve some earthwork requiring excavation below 4 feet bgs. Expansion of feedlots will start in 2002 and will consist of construction of a few pens each year. The issue of whether UNL needs UXO support to perform excavation of cattle pens and feedlots remains to be determined.
- UNL plans to build a new swine facility and dairy facility in the general vicinity of the existing swine and dairy facilities. This would involve minimal excavation; buildings would be slab on grade with footings to approximately 4 feet bgs.
- Small building projects are planned adjacent to former Load Line #2 at the Agronomy Center and at the swine facility. These structures would consist of slab on grade with footings extending to approximately 4 feet bgs.
- All over the property: UNL plans to improve fencing that will include post-hole digging along fence lines. Post-hole digging of gates would be to 4 feet bgs. Fencing will be removed and replaced at dairy facility at former Load Line #1.
- UNL plans to construct sewage lagoon in the triangle area of Load Line # 2.
- UNL plans to install new underground water and electric lines on their property. This would involve trenching from 2-3 feet bgs for electric lines and 4 feet bgs for water lines.
- UNL is upgrading their irrigation wells. One well was installed (and one abandoned) in 1999 and 2 wells were installed (and two abandoned) in 2000. UNL plans to install one new well and abandon one old well each year.
- Two septic systems installed this year
- UNL plans to decommission the former NOP Wastewater Treatment Plant (WWTP) located near the NRD reservoir. This is located in the suspected mustard gas container (chemical agent identification sets (CAIS)) disposal area (the area is currently fenced). There is record of the encounter of a green-colored gas under pressure during historical digging in this area. It was reported that the green gas was “squirting from the drilled hole.” Upon encounter of the gas, work was stopped, the hole was filled, and the field crew moved to another location to commence digging. To date, the identity of the green gas has not been determined, though USACE does not believe that it was mustard gas since mustard gas is colorless.
 - Dan Duncan, UNL ARDC, confirmed the occurrence.
 - Craig Bernstein, EPA, requested that USACE investigate this occurrence.
 - Richard McManaman, the former ARDC facility engineer, was the person who reported the occurrence.

INTERVIEW MINUTES: Dan Duncan – UNL ARDC

- ACTION: USACE will call Mr. McManaman to get a first hand report of the instance.
- Question 3: *Describe any changes in accessibility of the former NOP site in the last 5 years.*
 - The UNL ARDC property is wide open (accessible to the public) and is accessed by state highway and county roads. There are 21 miles of county road and six miles of paved highway. The fencing on the west side of Site 10 by the reservoir is broken down. There was a hunting club that recreated by the reservoir, but these activities have been curtailed by the University based on the question of OE uncertainty in and around the west shore of the reservoir.
- Craig Bernstein, EPA, asked about the [partial] bomblets found in 1999 during investigation at the NRD reservoir.
 - Brad Lasater, CENWO, stated that the type of [partial] bomblet found was not known to have been manufactured at the NOP site.
 - Dan Duncan, UNL ARDC, suggested that perhaps the [partial] bomblets might have been brought to NOP for disposal from Offutt Air Force Base.
- Discussion of the NRD Reservoir
 - The reservoir was built for flood control
 - There is seasonal fluctuation in water level of the reservoir
 - The reservoir was lowered in 1999 for the Remedial Investigation of OU-3. Approximately 25 feet of shoreline was exposed when the water level was lowered. The [partial] bomblets were discovered during this investigation (1999).
- Question 4: *Describe any operations or activities in recent years that you feel may have been related to ordnance and explosives.*

Dan Duncan, UNL ARDC, stated:

 - During 1997 soil excavation in the load lines and soil incineration activities, crystalline TNT was discovered (nugget form). This was likely from building demolition, where TNT was likely in the building foundations and then seeped into the soil. Brad Lasater confirmed that Offutt AFB EOD units performed post-Army demolition of off-specification ordnance at the burning and proving ground.
- Question 5: *List specific ordnance-related instances that you are aware of that have occurred in the last 5 years on your property or at the former NOP.*

INTERVIEW MINUTES: Dan Duncan – UNL ARDC

Dan Duncan, UNL ARDC, stated:

- UNL has not found anything on their property in the last 5 years. UNL has had a moratorium since approximately 1994 that says no one is allowed at certain locations on their property where ordnance is expected. Therefore, they would not expect to find any instances of ordnances.
 - UNL issued the moratorium as a result of survey reports and USACE/DOD work on the property that identified locations where ordnance was highly suspected to be present.
 - UNL put up fencing and signs around the former load lines to keep people out of the area.
- Question 6: *Have you called local authorities such as the Saunders County Sheriff, to report ordnance instances? If so, describe the circumstances and what specifically was found.*

Dan Duncan, UNL ARDC, stated:

- UNL has not called to report any instances.
- Question 7: *What are your concerns about ordnance at the former NOP?*

Dan Duncan, UNL ARDC, stated:

- The “unknown” is UNL’s greatest concern. Specifically, they have concerns with the culvert area (Site 5) and the proving ground (Site 9).
 - The culvert area (Site 5) is not fenced and grass in the area is currently mowed. According to the 1996 EE/CA, not all anomalies based on the magnetometer were investigated in the area of Site 5. Only a random check of anomalies was conducted. Those anomalies that were checked were only cleared to 4 feet bgs. Some subsurface anomalies were not checked. ACTION: USACE will verify this fact.
 - Workers are not to dig postholes for fencing and gates.
 - The feed pens in the culvert area (Site 5) are occasionally mowed by UNL, but nothing else is done in that area.
 - UNL cannot do anything with the burning/proving ground Site 9), as far as they are concerned. UNL does not maintain this area and it is not even mowed.
- Basically, UNL has concerns with those specific areas where there are restrictions on land use (such as site 5, site 9, and landfill areas).

INTERVIEW MINUTES: Dan Duncan – UNL ARDC

- UNL is also concerned about access to the NRD reservoir where the [partial] bomblets were found in 1999. It is a common area for local teens/kids to gather.

October 15, 2001

MEAD OE RECURRING REVIEW PUBLIC MEETING ATTENDANCE RECORD

Date/Time: 11 October 2001/1630 to 1830 hrs

Place: Mead Community Center – Mead, Nebraska

File: Former Nebraska Ordnance Plant (NOP) – Mead, Nebraska

Purpose of Public Meeting:

Allow interested stakeholders to relate incidents or concerns regarding OE at the former NOP.

Attendees:

Mary Budny	CENWK
Charles Colbert	CENWK
Tom Graff	CENWK
Brad Lasater	CENWO
Craig Bernstein	USEPA, Region VII
Tom Lorenz	USEPA, Region VII
Jonathan Kahn	USEPA, Region VII
Fred Molloy	TechLaw, Inc.
Greg Larson	Mead Police Department
Ross Rasmussen	RAB Member
Larry Angle	Lower Platte North NRD
Melissa Honecky	Mead Resident, RAB Member
Katie Saniuk	RAB Member
Eric Fritzsich	Nebraska Military Department

- Erick Fritzsich of the Nebraska Military Department stated that historically they have not used live ordnance greater than or equal to 20-mm shells. The Nebraska Military Department currently owns a portion of the former NOP site.



DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896

October 15, 2001

MEAD OE RECURRING REVIEW MEETING MINUTES
INTERVIEW: Doris Karloff – Saunders County Board of Supervisors

Date/Time: 12 October 2001/0900 to 1030 hrs
Place: Saunders County Courthouse, Wahoo, Nebraska
File: Former Nebraska Ordnance Plant (NOP) – Mead, Nebraska

Purpose of Meeting:

Allow interested stakeholders to relate incidents or concerns regarding OE at the former NOP.

Attendees:

Doris Karloff	Saunders County Board of Supervisors
Mary Budny	CENWK
Charles Colbert	CENWK
Tom Graff	CENWK
Brad Lasater	CENWO

- Introduction and welcome by Tom Graff
- Mary Budny distributed copies of interview questionnaire and OE Recurring Review Plan to facilitate meeting
- Doris Karloff is not aware of any past or future land use changes in the area or at the former NOP.
- Tom Graff asked if private landowners to the north of the former NOP have ever reported instances of ordnance (i.e., through permitting or other county processes).
 - Doris Karloff stated: Saunders County does not have record of any ordnance instances reported in recent years. Specifically, no instances have been reported on properties to the north of the former NOP.

APPENDIX E – Site Visit Notes

October 15, 2001

MEAD OE RECURRING REVIEW SITE VISIT NOTES

Date/Time: 11 October 2001/0900 to 1600 hrs

Place: Former Nebraska Ordnance Plant (NOP) – Mead, Nebraska

File: Former NOP – Mead, Nebraska

Purpose of Site Visit:

To visually confirm the physical condition of the former NOP (site) and to verify current land use, site accessibility, and other factors affecting public exposure to ordnance risk.

Attendees:

Mary Budny	CENWK
Charles Colbert	CENWK
Tom Graff	CENWK
Brad Lasater	CENWO
Craig Bernstein	USEPA, Region VII
Tom Lorenz	USEPA, Region VII
Fred Molloy	TechLaw, Inc.

Site Visit Activities:

- The attendees met at the USACE trailer at the site to review historic documents and discuss sites to be evaluated.
- Specific items discussed and referenced in various documents include:
 - o NRD Reservoir was built in approximately 1973. The as-built drawings were completed in December 1975
 - o It was suggested during the site visit that geophysical investigation (Report by Dames & Moore, Jan-1995) conducted at the site appeared to be completed statistically. *The report states, however, that the geophysical data collected went through a data reduction and analysis process. The data were validated and edited prior to analysis.*
 - o At each site location, the site description was read from the below referenced PA; and each year's successive aerial photo were examined for evidence of OE activities (e.g., scarred land devoid of vegetation, etc). The team walked around the area to determine if there were any surface indications of OE and to verify a given site's exact location.
 - o Culvert Area, Site 5: 4 acres in size; a magnetometer study was conducted on ¼-acre of this area; 1991 Preliminary Assessment (Draft Engineering Report by TCT-St. Louis)

SITE VISIT NOTES – 11 OCTOBER 2001

states that the magnetometer survey discovered items not processed at the plant. Conclusion by attendees: the materials that were brought on-site for disposal were not necessarily processed at NOP (materials found on-site but not processed at the former NOP could potentially have come from Offutt Air Force Base in Bellevue, NE).

- ACTION – Site 5: USACE will attempt to review munitions supply records from Offutt. These records may provide information on historic disposal activities.
- Turnout Area, Site 6: 6 acres in size; located at current ARDC building; UNL has landscaped and farmed the land in this area (and erected the ARDC building over an area that showed evidence of scarred land devoid of vegetation shown in historic aerial photos); there is no evidence of craters in this location as indicated in the 1956 aerial photos.
- Attendees visited various sites at the former NOP and took photographs. The site visit included the following sites:
 - Turnout Area (Site 6)
 - Culvert Area (Site 5) – Signs are posted warning of potential explosive hazards in the area
 - NRD Reservoir (where partial bomblets were found) – Signs are posted warning of potential explosive hazards in the area
 - Water level in the reservoir was down several feet due to seasonal conditions
 - Tetryl Booster cups (aluminum) were exposed on the shoreline
 - Access to this area is not controlled. Signs of recent entry by the public were noted.
 - Landfill Area/Former Treatment Plant (Site 8) – The suspected mustard gas disposal area was not located during the site visit, although the occurrence of such disposal has historically not been substantiated by USACE.
 - Bomb Booster Area (Site 12) – former fireworks (black powder) manufacturing facility (currently sealed by Nebraska State Fire Marshall) and nearby Styrofoam plant

APPENDIX F – Photographs

Photo No. 1



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: Culvert Area (Site 5) - View West toward creek
Location: Former NOP, Mead, Nebraska

Photo No. 2



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: Culvert Area (Site 5) - Closed depression,
location of removal action to 4 feet bgs, View Northwest
Location: Former NOP, Mead, Nebraska

Photo No. 3



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: Sign at entrance to the NRD reservoir. Similar sign is posted on a tree at the Culvert Area (Site 5)
Location: Former NOP, Mead, Nebraska

Photo No. 4



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: Turnout Area (Site 6) – View to Southeast
Location: Former NOP, Mead, Nebraska

Photo No. 5



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: Turnout Area (Site 6) – Area (near trees) of potential scars indicated in 1991 PA Report, View to East
Location: Former NOP, Mead, Nebraska

Photo No. 6



Date: 18 October 2001
Project: OE Recurring Review
Photographer: Brad Lasater

Description: Turnout Area (Site 6) – Crater/Scar area indicated in 1991 PA Report, View Northeast
Location: Former NOP, Mead, Nebraska

Photo No. 7



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: Landfill Area/Former Treatment Plant (Site 8) –
Former Wastewater Treatment Plant, View to East
Location: Former NOP, Mead, Nebraska

Photo No. 8



Date: 18 October 2001
Project: OE Recurring Review
Photographer: Brad Lasater

Description: Landfill Area/Former Treatment Plant (Site 8) –
Edge of landfill cap at former Treatment Plant, View to North
Location: Former NOP, Mead, Nebraska

Photo No. 9



Date: 18 October 2001
Project: OE Recurring Review
Photographer: Brad Lasater

Description: Landfill Area/Former Treatment Plant (Site 8) –
Debris at former Treatment Plant, View to Northwest
Location: Former NOP, Mead, Nebraska

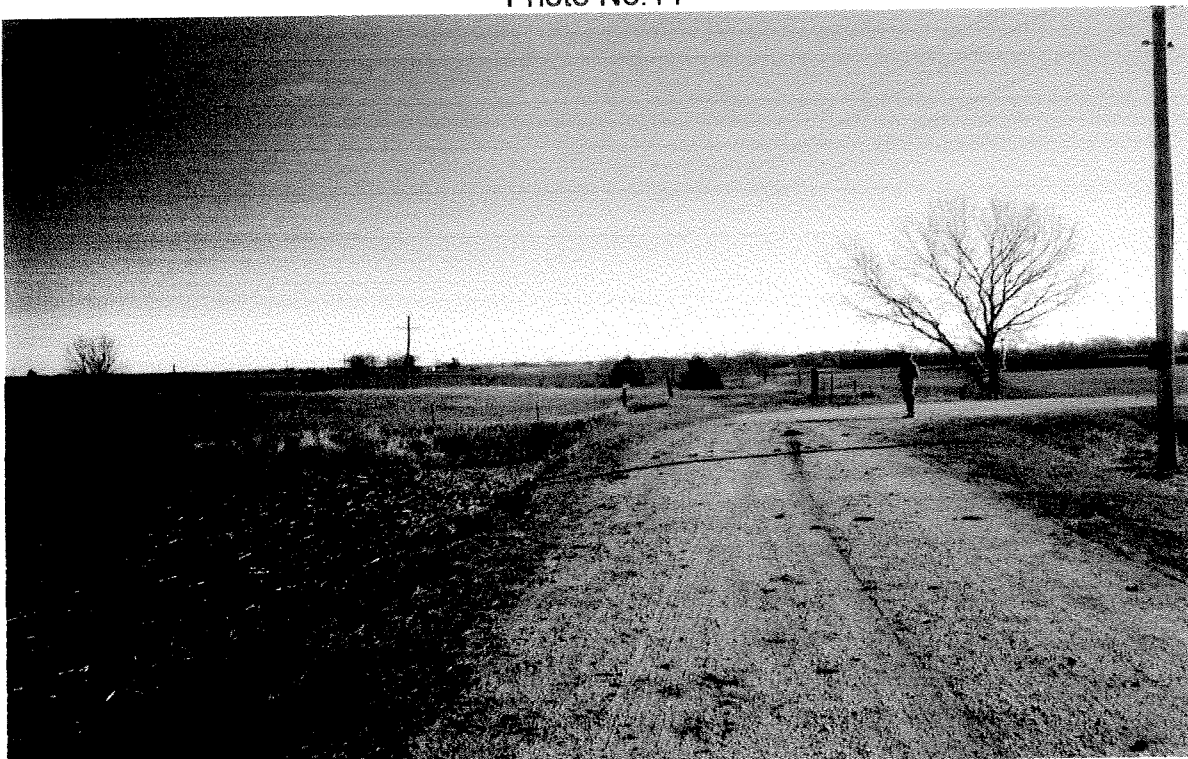
Photo No. 10



Date: 19 December 2001
Project: OE Recurring Review
Photographer: Lisa Travaglin

Description: Landfill Area/Former Treatment Plant (Site 8) –
Fencing around suspected CWM burial area, View to East.
Location: Former NOP, Mead, Nebraska

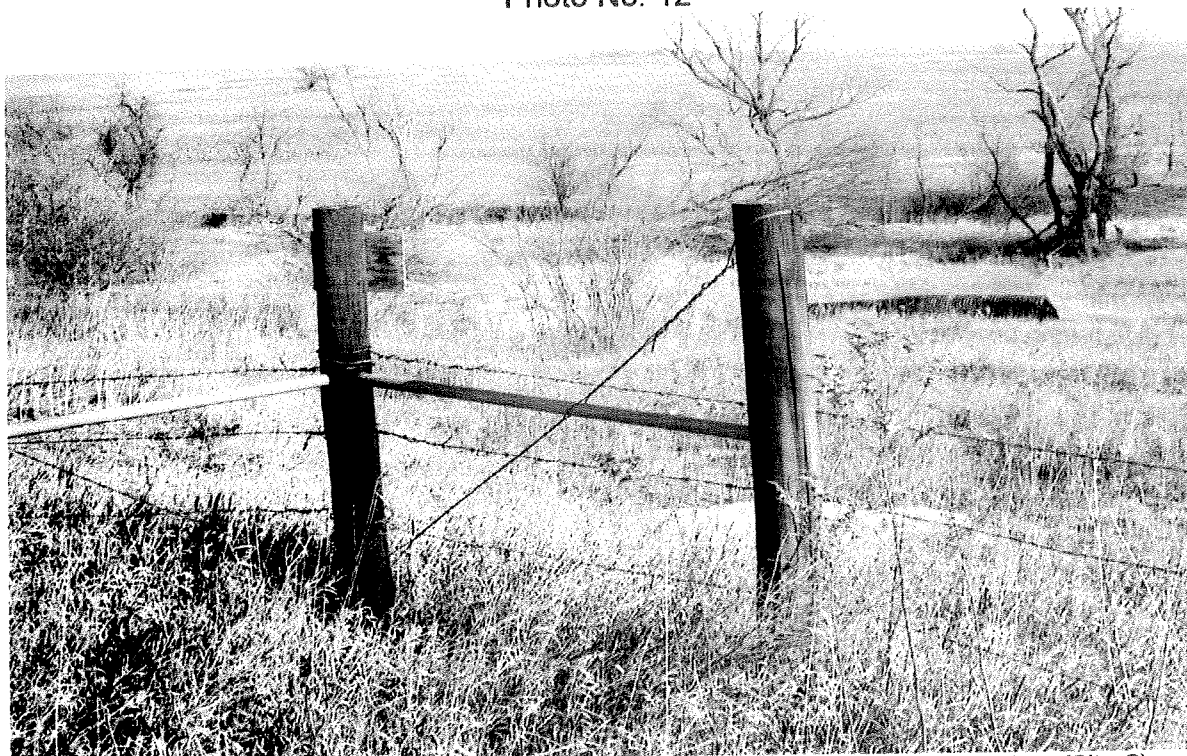
Photo No.11



Date: 19 December 2001
Project: OE Recurring Review
Photographer: Lisa Travaglin

Description: Landfill Area/Former Treatment Plant (Site 8) – Suspected CWM burial area, View to East-Southeast.
Location: Former NOP, Mead, Nebraska

Photo No. 12



Date: 19 December 2001
Project: OE Recurring Review
Photographer: Lisa Travaglin

Description: Landfill Area/Former Treatment Plant (Site 8) – Fence at Landfill Area, View to East.
Location: Former NOP, Mead, Nebraska

Photo No. 13



Date: 18 October 2001
Project: OE Recurring Review
Photographer: Brad Lasater

Description: Bomb Booster Area (Site 12) – Former
Fireworks Plant Office, View to West
Location: Former NOP, Mead, Nebraska

Photo No. 14



Date: 18 October 2001
Project: OE Recurring Review
Photographer: Brad Lasater

Description: Bomb Booster Area (Site 12) – Former
Fireworks Plant Office, new meter on side of building
Location: Former NOP, Mead, Nebraska

Photo No. 15



Date: 18 October 2001
Project: OE Recurring Review
Photographer: Brad Lasater

Description: Bomb Booster Area (Site 12) – Cultivated field south of Former Fireworks Plant Office, View to Southwest
Location: Former NOP, Mead, Nebraska

Photo No. 16



Date: 28 April 1999
Project: OE Recurring Review
Photographer: Lisa Travaglin

Description: NRD Reservoir – Partial bomblet discovered on shoreline in 1999
Location: Former NOP, Mead, Nebraska

Photo No. 17



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: NRD Reservoir – Shoreline, View to South
Location: Former NOP, Mead, Nebraska

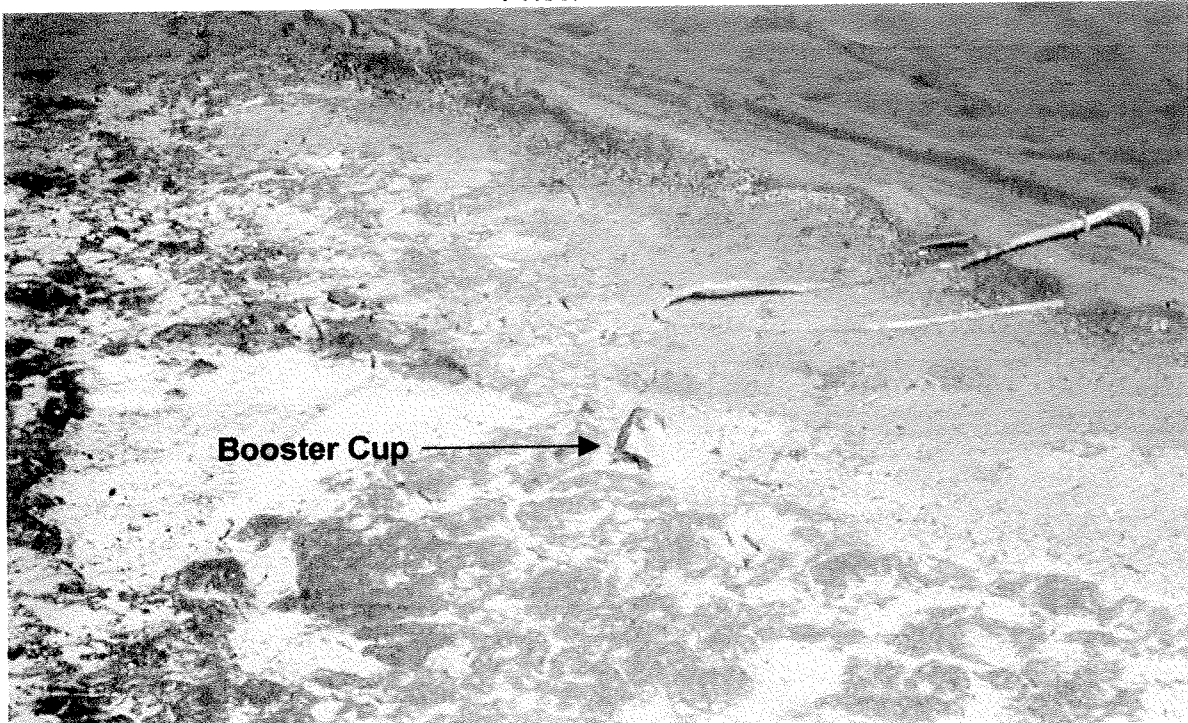
Photo No. 18



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: NRD Reservoir – Old bomb fuze exposed on shoreline
Location: Former NOP, Mead, Nebraska

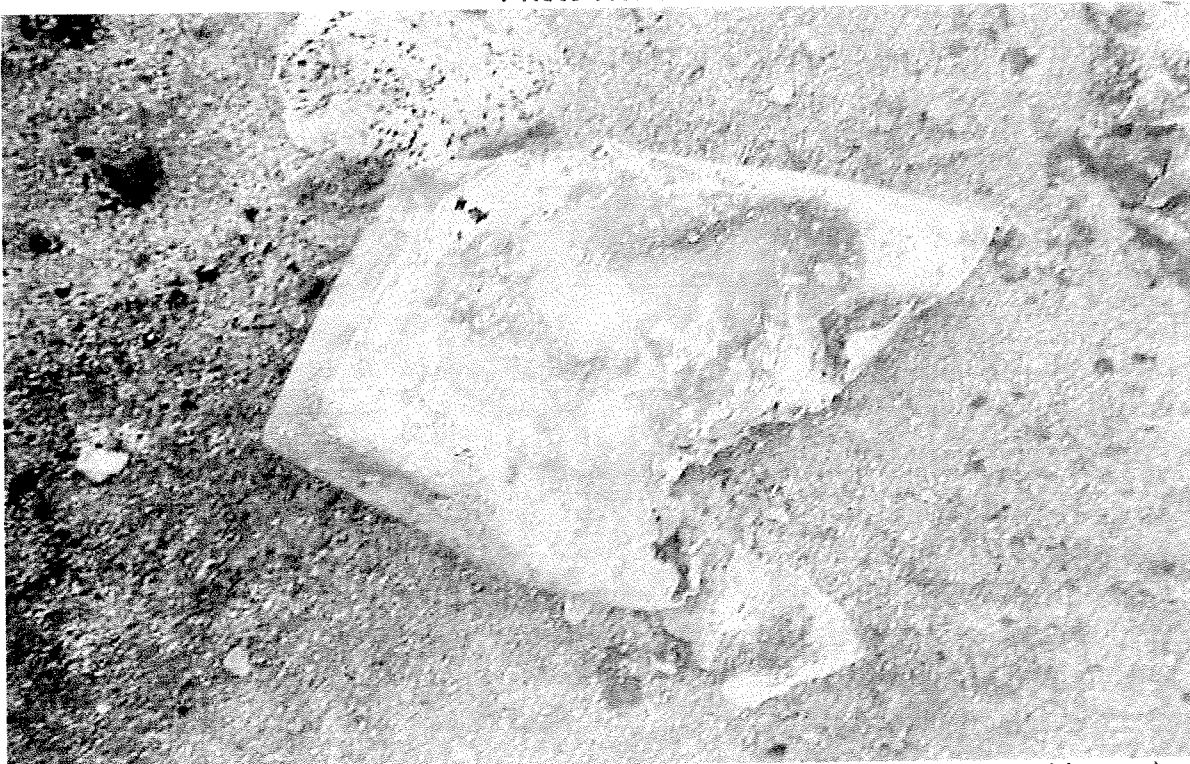
Photo No. 19



Date: 11 October 2001
Project: OE Recurring Review
Photographer: Mary Budny

Description: NRD Reservoir – Spent booster cup and debris exposed on shoreline
Location: Former NOP, Mead, Nebraska

Photo No. 20



Date: 18 October 2001
Project: OE Recurring Review
Photographer: Brad Lasater

Description: NRD Reservoir – Spent booster cup (close-up) found in various locations on shoreline
Location: Former NOP, Mead, Nebraska

APPENDIX G – Agency Concerns

The U.S. Environmental Protection Agency (EPA) provided comments on the OE Recurring Review Plan, in which they identified concerns regarding the potential deficiencies in the documentation submitted to EPA concerning ordnance issues at the former Nebraska Ordnance Plant (NOP). EPA contractor, TechLaw, Inc., conducted an evaluation of historic site OE documentation developed from 1983 to 1996. TechLaw's evaluation is presented subsequently.

TECHLAW REPORT TO EPA (November 2000)

INTRODUCTION

Unexploded ordnance (UXO) investigations at the Nebraska Ordnance Plant (NOP) are presented in several documents generated by the U.S. Army Corps of Engineers (USACE) and by various USACE contractors between 1983 and 1996. All of the documents attempt to research and investigate the potential for UXO to remain at various locations within the facility. Therefore, a complete assessment of any remaining UXO problems requires an evaluation of each of these documents. The following presents a brief summary of these documents with regard to the history of UXO investigations at the facility. An evaluation of these documents follows.

Archives Search Report (1983)

The *Archives Search Report at the Former Nebraska Ordnance Plant* (1983 ASR), dated 1983, is the earliest document referenced in the file material regarding UXO investigations at the facility. An ASR for UXO investigations is analogous to a Preliminary Assessment (PA) performed under conventional CERCLA hazardous waste investigations. The ASR is an important document for UXO investigations, since it can remove many potential sites from future geophysical investigations, based solely on the results of a file review. Therefore, the ASR should be a complete review of all file information related to ordnance at a site.

The 1983 ASR was not provided to TechLaw by USACE. Additional information regarding former investigations was provided instead (see below), however, it is the 1983 ASR which is referenced in other documents. Therefore, the 1983 ASR interpretations have not been evaluated to determine whether some areas at NOP were incorrectly removed due to misinterpretations of the file material. TechLaw recommends that the 1983 ASR be reviewed by an independent expert in ordnance and explosives (OE) to verify the depth of the research conducted and to validate the interpretations used to eliminate areas from future UXO geophysical investigations.

Preliminary Assessment of Ordnance Contamination (1991)

The *Final Engineering Report, Preliminary Assessment of Ordnance Contamination at the Former Nebraska Ordnance Plant, Mead, Nebraska* (1991 PA), dated April 1991, consists of a brief review of the 1983 ASR; additional file research into potential UXO sites; limited geophysical investigations at several sites; and soil sampling for explosives residues. In general, the 1991 PA attempted to investigate some of the sites identified in the 1983 ASR.

TechLaw performed a review of the 1991 PA and noted concerns with the investigative process and the interpretation of the information presented in the geophysical reports. These concerns are noted in the comments following.

Final Supplementary Archives Search Report (1993)

The *Final Supplementary Archives Search Report at the Former Nebraska Ordnance Plant, Mead, Nebraska, Site Number B07NE000900* (1993 Supplementary ASR), dated November 1993, provides additional interpretations with respect to a potential chemical warfare materiel (CWM) disposal area identified as the Landfill (Site 8). The document attempts to follow up on the potential CWM issue identified in the 1983 ASR and 1991 PA.

TechLaw performed a review of the data and interpretations provided by USACE personnel in the 1993 Supplementary ASR, and notes several issues with respect to conclusions that CWM is not present at NOP. These concerns are noted in comments that will follow.

Engineering Evaluation/Cost Analysis (1996)

The *Engineering Evaluation/Cost Analysis, Former Nebraska Ordnance Plant* (1996 EE/CA), dated February 1996, attempts to document geophysical investigations at sites identified in the 1983 ASR and 1991 PA. It also attempts to make recommendations regarding UXO risk for all sites identified.

REVIEW COMMENTS

TechLaw's review revealed several general types of deficiencies with UXO investigation activities performed at NOP. Deficiencies are noted for the following areas:

- Preliminary Assessment;
- Extent of Geophysical Investigations;
- Selection and Testing of Geophysical Instruments;
- Site Documentation; and
- Chemical Warfare Materiel Investigations.

Preliminary Assessment

EPA Comment:

1. Overall, there are several indications that an inadequate file review was performed with regard to potential UXO problems at the site. As previously stated, the primary file review document, the 1983 ASR, is an important document in that it initially removed many potential UXO sites from geophysical investigations, based solely on an interpretation of the file material. The 1991 PA states that the file review activity consisted of an evaluation of only 30 documents; a number substantially less than would reasonably be considered for a facility with the operational history of NOP. A "typical" ASR conducted for a facility similar to NOP would possibly have involved a review of hundreds of documents relating to the facility's operational history, ordnance tracking,

disposal records, correspondence regarding ordnance, and personnel interviews. There is no indication that this level of research was performed in preparation of the 1983 ASR.

USACE Response:

Comment noted. In general, PAs and Archives Search Reports (ASRs) conducted in the 1980s used standard USACE and EPA guidance for that time period. According to the USACE St. Louis District, ASRs conducted in 1983 did not necessarily include site visits, newspaper archive searches, National Archives searches, and aerial photographic interpretation. It is not known whether aerial photographs (which date as far back as 1938 for the NOP) were analyzed for the 1983 ASR. The ASR, prepared for U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), cited 43 references. The 1983 ASR included National Archive review but did not include site visits.

The purpose of the PA was to provide an independent review of USATHAMA's 1983 ASR. Approximately 30 documents were reviewed during the 1991 PA, and a large number information sources were later documented in the 1993 Supplementary ASR. The objective of the Supplementary ASR was to further document, clarify, and expand on the 1991 PA. The Supplementary ASR lists the review of 128 documents including maps, memos, letters, deeds, and telephone interviews. References from the PA Report and Supplementary ASR are included in Attachments G-1 and G-2, respectively.

EPA Comment:

2. In addition to the overall limited extent of the file review, the following issues were noted with respect to the depth of UXO research:
 - 2A. Neither the 1991 PA nor the 1996 EE/CA documents any file reviews or prior investigations performed for the extensive NOP properties that have been transferred to other agencies. For example, there is no evidence to suggest that any file reviews or prior geophysical investigations were performed for the following: 9,000 acres sold to the University of Nebraska; 1,000 acres transferred to the National Guard and Army Reserves; 2,000 acres transferred to the U.S. Air Force; or 40 acres transferred to the U.S. Department of Commerce. The Army should provide documentation that an adequate file review was performed on all transferred lands.

USACE Response:

Approximately 30 documents were reviewed during the 1991 PA. These sources included published reports, archived records, aerial photographs, and discussions with property owners, former workers and managers. The 1991 PA included interviews and a site inspection to assess land ownership, current and former land uses, and any knowledge that current occupants or past employees of the former NOP might have had concerning contamination related to DoD activities. The PA did not include the entire NOP facility, but focused on locations where UXO might have been present. A list of information sources contacted and documents reviewed for the PA is included in Attachment G-1. A large number information sources were later documented in the

1993 Supplementary ASR. The Supplementary ASR lists the review of 128 documents including maps, memos, letters, deeds, and telephone interviews.

The 1996 EE/CA included document and records reviews, aerial photography reviews, and field geophysics. Thirty-two references were cited in the EE/CA. Information gathered from these sources and historic reports was the basis for determining which locations at the former NOP would require response actions and which locations would require no further action. The EE/CA evaluated the entire NOP site. Areas that were not specifically addressed were classified as No DoD Action Indicated (NDAI) for OE.

EPA Comment:

- 2B. Neither the 1983 ASR nor the 1991 PA provides a review of all CWM file material for NOP. The 1991 PA presents a summary of findings from the 1983 ASR, indicating that the 1983 file review did not include an evaluation of *Record Group 175 (Chemical Warfare Service)*. This file material would have contained information on all CWM in the National Archives. The Army should provide a complete review of all *Record Group 175 (Chemical Warfare Service)* file material to document that a comprehensive file review was performed for NOP.

USACE Response:

A Supplementary ASR was developed for the USACE St. Louis District in 1993. The objective of the Supplementary ASR was to further document, clarify, and expand on the 1991 PA through archives searches and interviews. The Supplementary ASR states that review of Record Group 175 was not performed during the PA and as a result, Record Group 175 was reviewed during the Supplementary ASR in 1993. There was no documentation during the Supplementary ASR process to indicate that any information on CWM was found in Records Group 175. Information sources and references used for the Supplementary ASR are presented in Attachment G-2 at the end of this appendix.

EPA Comment:

- 2C. Neither the 1991 PA nor the 1996 EE/CA attempts to outline the findings of the 1983 ASR and document whether potential UXO areas identified in the document were eliminated from the geophysical investigations. The Army should provide clear justification for removing areas identified in the 1983 ASR from any UXO investigations.

USACE Response:

The 1991 PA was conducted by USACE to provide an independent review of the 1983 ASR by USATHMA. Based on the archive searches, walkover surveys, personnel interviews, and aerial photography, the areas of potential explosives contamination were reevaluated during the PA and consequently some of the areas identified in the 1983 ASR were eliminated. USACE believes that the elimination of certain sites is justified and that geophysical investigations were not necessary to arrive at that determination. Furthermore, the EE/CA evaluated the entire NOP site, although it was

not documented clearly in the report. Areas that were not specifically addressed in the 1996 EE/CA Report were evaluated and subsequently classified as NDAI.

EPA Comment:

- 2D. The 1991 PA states that 340,000 munitions items were destroyed in three “unspecified” detonation pits in 1946. This reference to activities occurring in only one year is a concern, since it is probable that more munitions were destroyed in subsequent years following World War II. However, no file review information is presented regarding this issue, nor is any further discussion provided. The Army should elaborate on their munitions disposal practices, including locations, other than the 1946 “unspecified” detonation pits, and provide adequate documentation for the research.

USACE Response:

This finding was noted in the 1983 ASR, which further documented that records searched did not indicate the demolition or burning of ammunition at any later dates. Therefore, USACE believes that the ASR and PA included sufficient file reviews to conclude that munitions were not destroyed at the former NOP after 1946.

EPA Comment:

- 2E. An inadequate file review and site investigation was performed to locate and delineate the demolition area(s) that would likely have been situated at NOP. The 1991 PA states that the demolition area for the entire NOP site consisted of only a few, relatively small sites. However, an installation the size of NOP typically required large sections of land for demolition activities. Disposal sites at similar installations, operated during the same time period (*e.g.*, Umatilla Army Depot, Black Hills Army Depot), maintained disposal sites substantially larger than any identified at NOP.

USACE Response:

The destruction of munitions in “unspecified” detonation pits was noted in the 1983 ASR. The ASR further documented that records searched did not indicate the demolition or burning of ammunition at any later dates. The PA, which provided an independent review of the ASR, did not report any additional information to dispute the findings of the ASR. The 1993 Supplementary ASR, which further documented, clarified, and expanded upon the 1991 PA did not discover any new information on demolitions areas. The Supplementary ASR noted 128 references. USACE believes a sufficient file review was conducted with regard to the evaluation of demolition areas at the former NOP.

EPA Comment:

- 2F. There is no documentation indicating that a file review was performed to investigate the possible presence of explosive reactive material in underground transfer lines and piping, used to transport explosives during plant operations.

USACE Response:

Bombs, projectiles, shells and mines were produced at the former NOP from 1942 to 1945. With the exception of ammonium nitrate, the materials used to manufacture weapons were fabricated elsewhere and shipped to the NOP for assembly. The Final Report on Decontamination and Shutdown Work at the NOP did not indicate the presence of process sewer lines on site and USACE has not discovered any information that would indicate that explosives materials were transferred underground.

Extent of Geophysical Investigations

EPA Comment:

3. Neither the 1991 PA nor the 1996 EE/CA provides justification for limiting geophysical investigations within those areas identified as potential UXO/OE sites. Most notably, the following concerns and deficiencies were noted with the approach to limit the extent of the geophysical surveys:
 - 3A. The 1996 EE/CA indicates that statistics were used to eliminate geophysical investigations from most of the UXO/OE high risk areas. However, there is no evidence that the statistical approach has been critically evaluated and proven to be valid and defensible. It is not recommended that a statistical approach be used in risk decision-making to select areas being cleared of UXO/OE. The Army should perform a complete geophysical investigation of all potential UXO/OE sites.

USACE Response:

Geophysics studies were performed for the 1991 PA, the 1996 EE/CA, and the 2000 RI Investigation Addendum Report for Operable Unit 3 (OU3). Geophysical investigations were only conducted at high-risk areas including Site 5 (Culvert Area), Site 9 (Proving Range), and Site 10 (North Burning Ground) based on historic evaluations and EE/CA field investigations. The EE/CA field investigation focused on those sites that had the potential to create a risk to public safety from OE. Prior to performing geophysics, records are reviewed to determine if specific sites provided potential risk. Aerial photography was also examined and evaluated. Therefore, elimination of sites was not based solely upon statistics. USACE believes that it has performed complete geophysical investigations of all potential OE sites.

EPA Comment:

- 3B. The 1991 PA states that the Turnout Area (Site 6) was investigated with only a limited magnetometer survey using a random search pattern, even though the area had been identified as a highly probable location for a UXO/OE disposal pit. No other geophysical investigations (*e.g.*, EM-61 survey) were conducted at the Turnout Area. Using a random search pattern with a surface-type locator only, does not sufficiently constitute a complete survey for such a high risk and discretely-located area as a UXO/OE disposal pit. The Army should provide for a complete geophysical survey of the entire area identified as the Turnout Area.

USACE Response:

At Site 6, a geophysical survey (magnetometer/metal detection) was conducted specifically in areas thought to be possible explosion craters indicated on the aerial photos. Of the contacts made in the survey, hand excavations revealed one ordnance-related item, a fuze with no explosive components. The PA and Supplementary ASR indicated no presence of OE in the vicinity of what was referred to as the turnout area. Site 6 was classified as No DoD Action Indicated in the 1996 EE/CA. A new facility, the Agriculture and Research Development Center (ARDC), was recently constructed by the University of Nebraska at the location of Site 6. According to the ARDC construction contractor, OE was not discovered during construction excavation. USACE does not believe there is need for additional investigation at this site.

EPA Comment:

- 3C. The Proving Grounds Area (Site 9) was used as an explosive demolition range to test various explosive components, yet was never completely investigated due to the presence of a large body of standing water during the investigations. None of the documents evaluated by TechLaw attempt to reconcile these incomplete surveys with an evaluation of UXO risk remaining at the site. The Army should provide for a complete geophysical survey of the entire area identified as the Proving Grounds Area, including those areas covered with water during previous investigations.

USACE Response:

In 1999, URS Corporation conducted RI activities for OU3 in the area near Site 9 adjacent to the NRD reservoir. During the RI, the NRD reservoir water level was lowered in order to allow for intrusive activities. The RI investigation included geophysical survey work and trenching. Information from the Supplementary ASR and the PA was used to determine the extent of the geophysics and additional RI work in the area near Site 9. The geophysical surveys determined areas for chemical contaminant sampling and areas that had a potential for further UXO screening. USACE does not believe there is a need for additional investigation at Site 9.

EPA Comment:

- 3D. The 1991 PA indicates that geophysical investigations uncovered ordnance items that were never actually processed at NOP. Therefore, it appears that NOP received ordnance items for disposal from offsite sources. It should be noted that, based on TechLaw's experience at other Army and military sites across the nation, systematic and comprehensive production and disposal records were not typically maintained. It is therefore, not an uncommon occurrence for unexpected source areas to be identified throughout the RI/FS process. In fact, EPA invoked a dispute with the Army based on just such an occurrence, in a letter dated December 23, 1997, citing that "While in the final stages of excavation...the Army found an unexpectedly large quantity of explosives in an area previously characterized as having little." Also, the PA 1991 states that the Culvert Area (Site 5) contained 75mm fragments, flare canisters, and a 57mm cartridge

case, although, NOP never actually processed these items during their normal course of activities.

Based on TechLaw's document review, it appears that none of this information was used to select the geophysical instruments used for the investigations. In addition, the Risk Assessment Report included within the 1991 PA does not address this issue when evaluating the remaining UXO/OE risk for NOP. The Army should thoroughly evaluate the possibility of remaining ordnance items from offsite sources to document the adequacy of the areas selected for geophysical investigations and the instruments used in the investigations.

USACE Response:

The PA was not intended to fully determine the extent of ordnance and ordnance-related debris. The subsurface geophysics investigations conducted during the PA were designed to achieve the detection of buried ordnance or ordnance-related debris at locations where UXO might have been present. The sites selected for investigation during the PA were chosen by evaluating the information gathered from site visits, historical reviews, personal interviews, and the review of aerial photographs, maps, and depot drawings. Magnetometry and metal detection surveys and electromagnetic surveys were conducted during the PA. These methods were used because of their capability of detecting the existence and approximate depth of ordnance items (metallic anomalies) or other burial or disturbed areas. USACE believes that the methodology and equipment used for the geophysical investigation was sufficient to achieve the general objectives of the PA.

Following the geophysical investigation, hand excavations of objects found within a depth of one foot were conducted during the PA. Site 5, the Culvert Area, was investigated during the EE/CA and suspected OE excavated and destroyed in 1997 Response Action. Subsurface investigations were also conducted during the EE/CA at Site 9 (Proving Grounds) and Site 10 (North Burning Ground). As a result of the December 23, 1997 letter referenced above, USACE conducted a supplemental investigation for OU-3 RI in 1999. Site 9, Site 10, the NRD Reservoir, the Potential Landfill Area, the Northeast Boundary Area, and area creeks were further investigated (including trenching and geophysics) at that time. The supplementary RI work did not find additional OE contamination. USACE believes that these investigations sufficiently evaluated OE in these areas.

Selection and Testing of Geophysical Instruments

EPA Comment:

4. Neither the 1991 PA nor the 1996 EE/CA addresses the limitations of the geophysical equipment used in the geophysical investigations. The results of the field investigations were used to calculate UXO densities at the facility, in addition to making risk decisions regarding remaining UXO at the site. It is, therefore, imperative to document the adequacy of the geophysical instruments and surveying teams/methods used. Some critical issues noted by TechLaw are as follows:

- 4A. The depths for geophysical investigations designed to detect UXO have been clearly established by the Department of Defense (DoD) under DoD Directive 6055.9-STD. This directive requires certain depth standards be used when dealing with suspected buried UXO. However, neither the 1991 PA nor the 1996 EE/CA indicates whether these characterization depths were ever achieved at NOP. In addition, neither document attempts to correlate specific land uses (*e.g.*, industrial or residential) with the specific search depth requirements identified within this directive. The Army should document whether the geophysical investigation depths (as identified for each land use class in DoD Directive 6055.9-STD) have been achieved for all potential UXO sites at NOP. In addition, the Army should provide a complete assessment of future land use which meets the requirements of DOD Directive 6055.9-STD.

USACE Response:

DoD Directive 6055.9-STD, dated August 1997, indicates the preferred method to determine the remediation depths is to use site-specific information obtained through historic information and site characterization data. Should that be unavailable, assessment depths for agricultural use and livestock grazing are indicated in the DoD Directive 6055.9-STD as 4 feet and 1 foot respectively. The majority of the site is used primarily for agriculture and livestock grazing. In interviews conducted during the OE Recurring Review, it was determined that land use is not anticipated to change in the future. Although the PA and EE/CA investigations were conducted prior to the issuance of the DoD directive in 1997, geophysical investigations conducted at the site took into account the characteristics of the site when determining the depths of investigation. The assessment depths required, 4 feet (for agricultural use) and 1 foot (for livestock grazing), were achieved in geophysical investigations conducted during the PA and EE/CA.

EPA Comment:

- 4B. There is no record that an adequate prove-out plot, and associated testing, was developed and implemented to document that the geophysical instruments (and surveying teams) were capable of identifying and analyzing geophysical anomalies at specific depths. At a minimum, the geophysical investigation should be required to meet the investigation requirements identified in DoD Directive 6055.9-STD. The Army should provide complete documentation that a successful prove-out plot and associated testing was developed and implemented, also indicating whether the requirements of DoD Directive 6055.9 were met.

USACE Response:

Comment Noted. It is uncertain as to whether a prove-out plot was developed and implemented. The geophysical investigations conducted for the PA and EE/CA were performed in association with work plans approved by USACE-Huntsville and prior to issuance of the DoD directive in 1997, therefore they may not meet all requirements of the DoD directive.

EPA Comment:

- 4C. The sensor technologies used are recognized as useful for detecting and locating buried UXO, however, certain limitations on the detection equipment should be addressed. For example, the EM-61 and the Schoenstedt GA-72C, both used at NOP, are designed to detect buried anomalies. The EM-61 detects all metals, both ferrous and non-ferrous, while the Schoenstedt GA-72C is primarily designed to detect ferrous utilities lines and equipment. Both instruments are limited to shallow or medium depth investigations, depending on target size and mass. In addition, the EM-61 is designed to detect changes in soil density only and should not be used to detect buried objects. None of the documents reconcile these deficiencies with the types and depths of ordnance potentially present at each site, in an attempt to document the actual vertical extent of the geophysical surveys.

USACE Response:

Comment noted.

EPA Comment:

- 4D. As previously noted, there are several sites where anomalies were not re-acquired for investigation and excavation. For example, the 1996 EE/CA indicates that several deeper anomalies at the Culvert Area (Site 5) were never re-acquired and excavated due, in part, to the limited vertical detection capabilities of the geophysical instruments. Geophysical instruments capable of deeper characterization, such as a total field magnetometer (*e.g.*, Geometrics G585), should have been used for the deeper investigation of ferrous metal objects. The Army should conduct a complete investigation of the Culvert Area to re-acquire all anomalies originally identified in the 1996 EE/CA.

USACE Response:

The EE/CA recommended surface clearance and subsurface clearance at Site 5 to a depth of 1 foot. This recommendation was based on land use. A six-acre portion of the site was cleared to 4 feet during the 1997 Removal Action. An evaluation of complete clearance at Site 5 was conducted during the EE/CA and found that associated costs for complete clearance at Site 5 were also found to be prohibitive. Clearance area was determined based upon review of aerial photography, historical records of land use, and current land use. USACE believes this area was adequately characterized and cleared for OE within technology and costs limitations.

Site Documentation

EPA Comment:

5. The 1991 PA and the 1996 EE/CA contain many deficiencies with regard to site documentation and reporting, in addition to many inconsistencies between text information and tabular data. The following concerns and deficiencies were noted:

- 5A. The 1991 PA indicates that magnetometer and metal detector surveys at the Culvert Area identified 17 ferrous objects, however, the document states that only seven of these anomalies were ever excavated. The document does not discuss the 10 remaining anomalies or explain why they were not excavated.

USACE Response:

The hand excavations conducted in the PA were limited to objects found within a depth of one foot. Seven of the seventeen ferrous objects detected in the Culvert Area were located within a depth of one foot. Since the 10 remaining anomalies were not within the one-foot depth, they were not excavated. This area was subsequently geophysically investigated during the EE/CA and a removal action was conducted on a six-acre portion of land at Site 5 in 1997. A total of 13 OE items were encountered at depths of 1-24 inches. These items were removed at Site 5 during the 1997 removal action and the area was cleared to 4 feet bgs. In 1997, USACE issued a Statement of Clearance, which recommended the six-acre portion of Site 5 be used for any purposes which do not involve intrusive activities below 4 feet.

EPA Comment:

- 5B. The 1991 PA states that earlier reports identified what might have been a small (*i.e.*, ¼-acre) disposal site in the area identified as the Turnout Area (Site 6). This potential pit area contained numerous metallic contacts, and should have been the focal point of any geophysical investigations in this area. However, neither the 1991 PA nor the 1996 EE/CA states whether this area was ever investigated.

USACE Response:

According to the PA, the small (¼-acre) area had been identified during an initial survey in 1989 as “possibly containing metallic contacts.” However, that area could not be located during the PA field investigation, which is why it was not investigated. Five possible craters located from aerial photos were geophysically investigated during the PA. One ordnance-related item, a fuze with no explosives components, was located in the area thought to be a detonation crater. According to the PA report, the location of this finding is within the possible kickout range from Site 5 and it was noted that the fuze may have come from the demolition of items at Site 5.

Site 6 was classified as No DoD Action Indicated in the 1996 EE/CA. A new ARDC facility was recently constructed at the location of Site 6. According to the ARDC construction contractor, OE was not discovered during construction excavation. USACE does not believe there is a need for additional investigation at Site 6.

EPA Comment:

- 5C. The 1996 EE/CA identifies the Culvert Area (Site 5) as a former demilitarization/disposal area. Inconsistencies regarding anomalies detected and anomalies excavated are evident when comparing tables in the report (*i.e.*, Tables A-1 and A-3). The document indicates

large and small objects were detected at depths greater than two feet, however, the re-acquisition and excavation of these anomalies did not extend to these depths.

USACE Response:

Table 2-1 in the EE/CA identifies 107 anomalies addressed at Site 5. Of the 107 identified, 79 anomalies were excavated. The depths of those 79 anomalies are presented in Tables A-1, A-2, and A-3 of the EE/CA report. Most of the anomalies were within 1 foot (12 inches) below ground surface (bgs). Five anomalies were excavated from 12-inches to 48-inches deep.

The EE/CA recommended surface clearance and subsurface clearance at Site 5 to a depth of 1 foot. This recommendation was based on land use. A six-acre portion of the site was cleared to 4 feet during the 1997 Removal Action. An evaluation of complete clearance at Site 5 was conducted during the EE/CA and found that technology limitations exist in detecting potential OE to 10 feet below the ground surface. Associated costs for complete clearance at Site 5 were also found to be prohibitive.

EPA Comment:

5D. The North Burning Ground Area (Site 10), identified as a possible disposal site, exhibited anomalies during the geophysical investigation that were never excavated and recovered. Numerous anomalies were identified at up to four feet below ground surface, yet tabulated data indicates that only one target from that depth was re-acquired, excavated, and recovered. Most of the items recovered were from a depth of less than one foot below ground surface. In addition, metallic targets up to six feet in diameter were identified in the geophysical report, but are not documented as being excavated and recovered. Although the 1991 PA indicates that additional geophysical surveys were performed at this site, the surveys accounted for only a small percentage of the total site area [*i.e.*, only 1.4 acres of the total 5.0 acres (28%)]. In addition, the investigations reported in the 1991 PA identified over 100 anomalies, although the document is unclear regarding the identification of all of these anomalies. Because the North Burning Ground Area served as one of two sites for the disposal of approximately 340,000 ordnance items, the site warranted closer scrutiny in the geophysical investigations and subsequent excavation activities.

USACE Response:

Comment noted. Table 2-1 in the EE/CA identifies 130 anomalies addressed at Site 10. Of the 130 identified, 127 anomalies were excavated and two of those were identified as inert OE. Appendix A of the EE/CA present the depths and size of those anomalies excavated in Site 10, many of which exceed one foot in depth. The EE/CA recommended NDAI for OE at Site 10.

During the PA, two trenches were excavated in Site 10 in areas of ferrous saturation. Hand excavations were conducted in both pit areas that revealed one OE-related item (spent booster cup), which did not contain explosive components. All other contacts hand excavated from the pits were non-ordnance items.

USACE conducted supplemental RI work at the former NOP in 1999, which included geophysical and subsurface investigations. Site 10 was included in the 1999 investigation. The geophysical surveys conducted during the additional RI investigation determined areas for chemical contaminant sampling and areas that had a potential for further UXO screening. Two test pits were placed at the assumed location of two former revetments. In 1999, no OE was detected while excavating at Site 10. USACE is satisfied with the extent of investigations conducted historically at this site.

EPA Comment:

- 5E. The geophysical report for the Proving Grounds Area (Site 9) indicated anomalies up to 14 feet deep. However, there is no indication that the Army attempted to locate any targets deeper than three feet below ground surface. In addition, there is no evidence that any investigations took place to locate buried trenches detected during the geophysical surveys.

USACE Response:

Comment noted. USACE believes that there were a sufficient number of accessible anomalies collected in the area of Site 9 during the EE/CA. In addition, a 1999 investigation for OU-3 focused on several sites, including Site 9. As part of that investigation, geophysical surveys were conducted at Site 9 and the buried trenches were identified at that time. Soil samples were collected from 33 individual test pits at Site 9 during the 1999 RI and were analyzed for explosives constituents. Test pit depths ranged from 2 to 10 feet bgs. The test pits were found to have consisted mostly of ash, building debris, and rubbish. No OE was detected at Site 9 during the 1999 investigation.

EPA Comment:

- 5F. The sites identified as the Bomb Loading Lines (*i.e.*, Sites 1, 2, 3, and 4) were recommended for No Further Action, even though no geophysical investigations were performed in these areas. None of the documents attempt to evaluate remaining UXO/OE risks at the Bomb Loading Lines, nor do they discuss any future UXO/OE investigations.

USACE Response:

Comment noted. Since no unexploded ordnance were discovered within the Bomb Load Lines during the visual survey conducted during the PA, USACE found it unnecessary conduct a geophysical investigation in the area. USACE collected over 400 surface soil samples (0-1 feet bgs) in the load lines areas during the PA and subsequently investigated the basin and sump area of the load lines under OU1. USACE is satisfied with the no further action recommendation for the load lines determined in the EE/CA.

EPA Comment:

- 5G. The 1996 EE/CA does not provide figures showing the locations of any of the geophysical surveys performed. It is therefore, difficult for the Army to demonstrate that the surveys covered the full extent of the areas identified in the 1991 PA.

USACE Response:

Comment noted. The locations of the anomalies investigated during the EE/CA were included in Appendix A of that report. The Geophysical Investigation Report dated January 20, 1995, which presents the EE/CA geophysical data, was prepared under separate cover by Dames & Moore. This report provides maps and indicates grid layouts for the geophysical investigation conducted for the EE/CA. An Executive Summary Report dated March 8, 1995 was subsequently submitted to USACE by Sanford Cohen & Associates, Inc., which provided the methodology and results of further analysis of the EE/CA geophysical data collected by Dames & Moore.

Chemical Warfare Materiel Investigations

EPA Comment:

6. None of the documents indicate whether an adequate file review or investigation was performed regarding the disposal of CWM at the area identified as the Landfill (Site 8). As previously noted, the 1991 PA presents a summary of findings from the 1983 ASR which indicates that no evaluation was performed for *Record Group 175 (Chemical Warfare Service)*, the file material containing all CWM information in the National Archives. Therefore, neither the 1983 ASR nor the 1991 PA provides a sufficient review of all CWM file material for the site. In addition, the following deficiencies were noted with regard to CWM and the resulting conclusions for the site:
- 6A. File material indicates that in the 1950s, six rounds of *leaking* CWM were buried at the area identified as the Landfill. Most notably, a *Survey and Analysis Report* (November 1993), produced by the U.S. Army Program Manager for Non-Stockpile Chemical Materiel, makes a statement regarding the “likely burial” of CWM at the Landfill. Use of the term “likely burial” indicates a high probability of burial in the Landfill, compared to other designations which might have been used, but were not (*e.g.*, suspected burial or possible burial). However, the 1996 EE/CA states this information is “hearsay” and that no actual documentation exists to suggest that CWM disposal ever occurred at NOP. Based on the 1993 *Survey and Analysis Report*, which sufficiently documents the “likely burial” of CWM at the Landfill, this conclusion is incorrect. The Army should provide justification for not performing CWM investigations at the Landfill.

USACE Response:

In the Supplementary ASR, the evidence of CWM at the former NOP was evaluated and Record Group 175 was included in this evaluation. It was acknowledged in the Supplementary ASR that canisters of CWM were reportedly disposed of in the landfill area around 1950 and 1960. The exact location of the buried alleged CWM is not

known. The landfill has since been closed and capped with a soil cover and the area is fenced. The research conducted during the Supplementary ASR revealed no evidence that would indicate the presence of CWM at any other location at the former NOP. Interviews relevant to CWM presence at the NOP are included in Appendix C of the OE Recurring Review Report dated June 2002. Review of these interviews has not substantiated this occurrence. Groundwater monitoring wells were installed downgradient of the landfill area in 1992. Samples from these wells have found no detections of thiodiglycol, an indicator of CWM, to date.

EPA Comment:

- 6B. The 1993 Supplementary ASR contains several technical problems with regard to the correct identification of potential types of CWM at the Landfill. All references in the 1993 Supplemental ASR identify “mustard” as the only CWM agent potentially present at the site. However, a detailed review of the document indicates that other CWM agents may be present as well. For example, in a letter dated October 20, 1993, from a USACE contractor (TCT, St. Louis) to the USACE (St. Louis District), interviews with three former individuals indicated that additional CWM was potentially buried at the site. Most notably one former employee identified photographs of chemical warfare tests kits (*i.e.*, “Toxic Gas Sets”) as being similar to items formerly buried at the site. In addition, the former employee correctly described the physical appearance of the chemical warfare test kits, and identified the items as having arrived at NOP in a “leaking condition” from an Army reserve unit. The fact that the items were described as “leaking” increases the likelihood that they were sent to NOP for disposal. Also, in an August 24, 1993, interview, the former Civilian In Charge of NOP stated that he observed the burial of five or six, two-foot long “leaking” canisters of Mustard Gas within the Landfill. The Army should conduct a complete review of this information to evaluate whether additional CWM may have been disposed of at the Landfill.

USACE Response:

A record of the interviews referred to by EPA is included in Appendix C of the OE Recurring Review Report dated June 2002. These interviews provide three accounts from different individuals, however only two of those individuals worked at the former NOP. The employee who correctly described the physical appearance of the chemical warfare test kits, and identified the items as having arrived at NOP in a “leaking condition” from an Army reserve unit, was actually an employee at Offutt Air Force Base, not the NOP. In his interview he stated that leaking containers from an Army Reserve Unit in Omaha were brought to Offutt Air Force Base (See Appendix C of the OE Recurring Review Report dated June 2002). The employee was later told that the containers were taken to a “permanent Army burial facility” believed to be in Nebraska for disposal, though he did not know the specific location.

Although the August 24, 1993 interview with the former Civilian in Charge described “Toxic Gas Sets” as having arrived at NOP in a “leaking condition,” that person also revealed that the incident was *‘a little hazy in his memory and that at the time of the disposal he thought the incident to be a minor item, barely worthy of remembering.’* The

Supplementary ASR reported that this 1993 account differed from the 1989 interview of the same individual. The Supplementary ASR concluded that the two different accounts (in 1989 and in 1993) pertained to the same incident and that the discrepancy could be a result of a memory lapse. In the Supplementary ASR, it was determined that although the former Civilian in Charge was judged to be a credible interviewee, the information provided by him is not judged to be indisputable evidence concerning the current presence of CWM at the former NOP.

The third employee who was interviewed on this subject was the NOP facility manager at the time. When this employee was sent a letter containing color photographs of chemical weapons identification and training kits (i.e., "Toxic Gas Sets"), he stated that he had not seen anything like that [on the NOP]. A copy of the letter and photos sent to the manager and others is included in Appendix C of the OE Recurring Review Report dated June 2002.

There is a discrepancy concerning the date of the burial as it was identified as having occurred during the 1950s in historic reports, yet the interviews indicate that it occurred in the 1960s. The occurrence was reported more than 30 years after it was said to have occurred. The Supplementary ASR concluded that the incident could feasibly have been a miscommunication or misunderstanding concerning the composition of the items disposed, which is why it was subsequently dismissed from the EE/CA and other reports.

EPA Comment:

6C. Based on the wording in the 1996 EE/CA, it appears that the authors made several assumptions regarding the Mustard Gas (blister agent) reportedly buried in the area of the Landfill. The authors assumed that, because there had been no detections of thiodiglycol in the groundwater from the area of the Landfill, the reports of the burial were in question. The 1996 EE/CA, therefore, concludes, that CWM is not present. However, thiodiglycol is produced by the decomposition of 1,1-thiobis[2-chloroethane]. For this decomposition to occur, 1,1-thiobis[2-chloroethane] must be in direct contact with water. If the munitions containing CWM are still intact, then the decomposition would not have occurred yet. The fact that thiodiglycol has not been detected does not mean that CWM is not present, it may simply mean that the integrity of the CWM is still intact and has not *yet* leaked. The presence or absence of thiodiglycol should not be used to determine the presence or absence of Mustard Gas (blister agent).

USACE Response:

USACE sampled for thiodiglycol to identify the presence of CWM in groundwater, if any, however its absence in the samples is not the sole reason USACE questions the existence of buried CWM. As stated previously, historic documentation of CWM burial does not exist and accounts given by former employees related to CWM burial have not been substantiated by USACE.

EPA Comment:

- 6D. An additional incident, indicating the possible burial of CWM at the Landfill, occurred in 1979 when a contractor performing excavations was exposed to an unidentified gas. The odor and physical effects experienced by the excavator operator are similar to those of another type of CWM, possibly triphosgene. This information was not included or investigated in any of the documents.

USACE Response:

The 1979 incident was documented in the Supplementary ASR and 1993 interviews with the personnel who reported the incident are included in Appendix C of the OE Recurring Review Report dated June 2002. The manager stated that an excavation contractor, who was digging in the landfill area at the time in question, reported to him that he thought he had hit a gas line. The manager and contractor returned to the excavation and observed a greenish yellow-colored gas, which he thought looked similar to chlorine gas. The gas was reported to have discolored the soils to dark green. The manager did not know what the substance encountered was, nor did he recall the odor of the gas. During the interview, the manager described the gas as 'something he was exposed to in Army basic training.' The source of the gas is not likely to have come from mustard agent. Mustard agent freezes at approximately 58 degrees Fahrenheit and has an extremely low vapor pressure. The term "mustard gas" is not an accurate description because gases are normally associated with higher vapor pressures (see Appendix C of OE Recurring Review Report).

Triphosgene is a solid that decomposes when exposed to moist air or water. If it was a gas, the likelihood is great that it dissipated from the subsurface. USACE believes it is unlikely that this substance was buried at the former NOP.

Miscellaneous Deficiencies

EPA Comment:

7. Several miscellaneous deficiencies were also noted regarding the investigations and the documentation of field activities. These deficiencies are as follows:
- 7A. Neither the 1991 PA nor the 1996 EE/CA identifies how USACE management communicated with appropriate state and federal regulatory personnel regarding planning and implementation of the geophysical survey and intrusive efforts. The Army should describe how project management was performed, identifying all Army/USACE personnel, all contractor/subcontractor personnel, and appropriate regulatory personnel consulted during the investigation. Lines of communication and regulatory notification of investigation activities should be provided.

USACE Response:

Comment noted.

EPA Comment:

- 7B. The 1996 EE/CA is inconsistent with the terms UXO and bulk explosives. The document states that the removal action goals were to address "...the degree and extent (concentration) of bulk explosives (UXO) in soil." However, had the correct definition of "bulk explosives" been applied it would have referred to loose or exposed explosive compounds (*e.g.*, nitroaromatics/nitramines) in the soil, and not the manufactured devices (*i.e.*, ordnance) that contain "bulk explosives." The document should make a distinction between the two, and clearly state that the investigation was intended only for the identification of UXO, not bulk explosives in soil.

USACE Response:

Comment noted. When referring to the EE/CA, USACE will clarify that UXO was addressed.

EPA Comment:

- 7C. The 1996 EE/CA defines explosive-reactive soil as soil which contains at least 12 percent explosives by weight. Since issuance of the 1996 EE/CA, the criteria for explosive-reactive soil has been reduced to 10 percent by weight, according to Army Engineer Regulation, ER 1110-1-8153 (May 1999). It is recommended the more conservative value be evaluated to determine whether the minimum safety standards, as defined by the Army, have been exceeded.

USACE Response:

Comment noted. Future references to the minimum safety standard will comply with ER 1110-1-8153.

ATTACHMENT G – Historical Information Sources And References

Attachment G-1
Attachment G-2

Preliminary Assessment References
Supplementary Archives Search Report References

ATTACHMENT G-1 – Preliminary Assessment References

**UDF DOCUMENTS
GENERAL
DERA 3431**

- 0002 - Letter from Public Affairs Officer, U.S. Army Depot Command
- 0003 - Notes 10/89, Visit to KC COE
- 0004 - Chemical Reference Handbook, Army Manual
- 0005 - Letter from U.S. Defense Ammunition Center
- 0006 - Letter from National Archives
- 0007 - National Archives, List of Record Groups
- 0008 - National Archive Publications
- 0009 - Cartographic and Architectural Branch, National Archives
- 0010 - Aerial Photo in the National Archive
- 0011 - Correspondence between Huntsville COE, UXB, and USATHAMA with Envirodyne
- 0012 - National Archives Select List of Publications
- 0013 - Packet USGS on Aerial Photos
- UDF-0014 - USGS Order Forms
- 0015 - Computer Printout of Aerial Photos for Project Sites
- 0016 - USGS Aerial Photo Summary Record System
- 0017 - Missouri Index to Topo and other Map Coverage
- 0018 - Missouri Catalog of Topo and other Published Maps
- 0019 - List of Earth Science Information Centers

**UDF DOCUMENTS
GENERAL
DERA 3431
(continued)**

- 0020 - USGS Aerial Photo Summary Record System
- 0021 - Letter from Military History Institute
- 0022 - USATHAMA Installation Restoration Program Quarterly Summary
- 0023 - Coordinates and Quads for Aerial Photos for Project Sites
- 0024 - Archive Research Contacts
- 0025 - Flowsheet for TNT Productions
- 0026 - Flowsheet for Smokeless Powder
- 0027 - Batch Process for TNT Production
- 0028 - Explosives Glossary
- 0029 - Letter from Bob Bouilly, Historian, Munition Center
- 0030 - Guide to U.S. Naval Administrative Histories
- 0031 - Tetryl Wastes
- 0032 - The Evolution of the Army Armament, Munitions and Chemical Command
- 0033 - Demolition Grounds, How to Prepare Ammo for Destruction (Army Inspection Guide)
- 0034 - Military Explosives and Their Hazards
- 0035 - Entries at Suitland for Ordnance Depots and Sioux Ordnance Plant
- 0036 - POC - U.S. Army Military History Institute
- 0037 - Naval POC's for Site Drawings

UDF DOCUMENTS

GENERAL

DERA 3431

(continued)

- 0038 - Laundry Facilities and Contamination
- 0039 - 1945 Ordnance Safety Manual
- 0040 - Disposal of Supplies and Equipment, Ammo - 1952
- 0041 - The AMC Safety Manual (what years produced)
- 0042 - Inventory of the Textual Records of the Office of the Chief of Ordnance (1964)
- 0043 - Letter to Fred Leggens - National Personnel Records Center
- 0044 - Letter to U.S. Department of Agriculture Aerial Photo Office
- 0045 - Letter to Jerry Loomey, AMCCOM Engineer
- 0046 - Letter to Theodore Schulte, Twin Cities Army Ammo Plant
- 0047 - Letter to Bob Bouilly
- 0048 - Database Assessment of the Health and Environmental Effects of Munition Waste Products
- 0049 - Portions of 1951 Ordnance Safety Manual
- 0050 - Memo from Bob Bouilly
- 0051 - Letter from Twin Cities Army Ordnance Plant
- 0052 - Installation Restoration Report Preliminary Assessment of the Twin City Army Ammunition Plant, 1988
- 0053 - Supplement to Army Ammunition Plant, 1988
- 0054 - Twenty Years Handling TNT in a Shell Loading Plant (Goodwin)

UDF DOCUMENTS
GENERAL
DERA 3431
(continued)

- 0055 - Trip Report, AMCCOM, Rock Island, Illinois
- 0056 - Information Relevant to Disposal of Hazardous Material at "O" Field, Aberdeen Proving Ground, Maryland

LIST OF DRAWINGS

<u>Facility</u>	<u>Subject</u>	<u>Scale and Date</u>
SAD	Demolition Ground Layout E-Area	1" = 300' 5-27-89
SAD	Contaminated Buildings and Areas on Depot	1" = 1200' 2-65
SAD	Ammunition Burning and Demo Facilities (Area "U" Plan Revised from Area "R")	1" = 300' 9-58
SAD	Burning Ground Layout "R" Area	1" = 300' 11-9-48
SAD	Ammunition Normal Maintenance Facilities Location Plan Layout Plan with Boring Logs	1" = 40' 4-14-53
SAD	Destruction Area Area R	1" = 300' 2-5-60
SAD	East Rifle Range General On-Site Map Possibly Proposed	1" = 1000' 12-14-61
SAD	Ammunition Services Site Location Plan with Boring Logs	1" = 1000' 2-12-52
SAD	Ammunition Workshop Area Location Map	1" = 200' 9-19-49
SAD	Safety Limits of Existing Firing Ranges Probably Proposed	1" = 1200' 5-8-60

LIST OF DRAWINGS
(continued)

<u>Facility</u>	<u>Subject</u>	<u>Scale and Date</u>
SAD	Area "U" Demolition Ground Layout Plan	1" = 300' 9-29-54
SAD	R-Area Layout	? ?
SAD	Destruction Area F	1" = 300' 2-3-60
SAD	Sioux Ordnance Depot Site Layout	? ?
NAD	U.S. Naval Ammunition Depot, Hastings, Nebraska	? 7-30-57
NAD	Hastings, Nebraska	1:2,000 1986
NAD	Depot with Indiana Pk, Training Area, Yd. Dump	
NAD	Topo Quad, Inland, Nebraska	1:24,000 1969
NAD	Topo Quad, Hastings East	1:24,000 1983
NAD	Topo Quad, Hastings West	1:24,000 1983
NAD	Aerial Photos	1:660 Feet 1951, 1956, 1963, 1969
SAD	Map of Contaminated Areas	1967

LIST OF DRAWINGS
(continued)

<u>Facility</u>	<u>Subject</u>	<u>Scale and Date</u>
SAD	Site Map	1:62,500 1948
SAD	Topo Quad, Brownson, Nebraska	1:24,000 1972
SAD	Topo Quad, Sidney, Nebraska	1:24,000 1972
SAD	Aerial Photos	1:660 feet 1954, 1960, 1966, 1967
NOP	Topo Quad, Mead, Nebraska	1:24,000 1969
NOP	Topo Quad, Ashland West, Nebraska	1:24,000 1969
NOP	Topo Quad, Wann, Nebraska	1:24,000 1968
NOP	Topo Quad, Wahoo East, Nebraska	1:24,000 1969
NOP	Map of Previous Owners	
NOP	Aerial Photos	1:660 feet 1949, 59
POP	Maps and Drawings of Site	1940's
POP	Real Estate Map and Site Layout	1970, 1945
POP	Topo Quad, Sevenmile Basin, Texas	1:24,000 1973

LIST OF DRAWINGS
(continued)

<u>Facility</u>	<u>Subject</u>	<u>Scale and Date</u>
POP	Topo Quad, Mayer, Texas	1:24,000 1973
POP	Previous Owners and Vicinity	1942
POP	Geologic Map	1:250,000 1981
POP	Aerial Photos	1:660 feet 1953, 1959

TABLE 1
SUMMARY OF RECORD SEARCH INQUIRIES

Location	Contact Date(s)	Contact Name	Results	Status
ives Safety	Tel. 9/19/89 Written 9/19/89	Mr. Gene Clark	Directed us to USATHAMA. Stated he had no pertinent information.	No further follow-up with Explosive Safety Board is required.
idria, VA	Tel. 9/20/89	Mr. Fred Liggins	Requested commanders' names in writing. He stated labor categories would not allow identification of ordnance disposal personnel.	Written response expected by October 11.
al Personnel Is Center uis, MO	Tel. 9/20/89 Written 9/20/89	Mr. Johnson	No pertinent information. Suggested we contact DEP Command.	No further follow-up with AMC Historical office is required.
Historical Office idria, VA	Tel. 9/15/89	Mr. Jim Walker	Sioux not in Depot system Army Tech Services phased out in 1962. Records in National Archives. He will review files. Recommended searching National Archives Records Groups 92, 156, 160, 179, 269	Written response expected after September 25.
Army DEP System and teany Arsenal ersburg, PA	Tel. 9/15/89 Written 9/15/89 Response 10/18/89	Mr. Stephen Abney	He has sent us a large package of information and leads where to look in National Archives. Suggests contacting Navy Historical Office.	Records Searched 10/26
Command sland, IL	Tel. 9/19/89 Written 9/19/89	Mr. Bob Bouilly	All records sent to National Records Center.	Written response received. Additional information sources were identified.
al Archives Modern y Branch	Tel. 9/15/89	Mr. John Taylor	Ordinance information has been sent to 12 Regional Archives.	No further follow-up with Modern Military Branch is required.
al Records Center ington DC	9/15/89	Ms. Becky Collier	Referred to National Archives, Record Groups 77, 156, 338 in Washington D.C.	A pamphlet is forthcoming.
al Archives al Archives City, MO	Tel. 9/15/89 Tel. 9/20/89	Ms. Myma Geesselbracht Mr. Mort Corriston	Referred us to National Archives, Washington DC. Record Group 234 (Reconstruction Finance Corp.).	No further follow-up with Kansas City required.
al Archives al Archives TX	Tel. 9/15/89	Ms. Barbara Rust	Received list of photos available. Photos required have been ordered.	No further follow-up with Dallas is required.
Earth and Science ation Center ike City	Tel. 9/15/89	-	Recommended we contact DOE.	Expect photos after 11/17.
District of Engineers	Tel. 9/18/89	Russell Holman	Requested a letter through James Fukua. Received EEI's letter. Assembling information.	DOE has established Holman as our POC.
llo, TX	Tel. 9/18/89 Written 9/19/89	Gordon Gabert	Package including data, maps, photos has been supplied to EEI	

TABLE 1
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
1st District of Engineers Historical Office Washington DC	Tel. 9/19/89 Tel. 9/20/89	Ms. Linda Wagner	Received package of information including report, photos, excerpts from file. Only have records prior to 1918.	Suggested contacting Sioux Army Depot Society, Ted Kadlcek. No further contact with them is required.
Historical Center National Archives Washington DC	Tel. 9/20/89 Letter 9/20/89	Ms. Kathy Lloyd	No information available. Suggested we contact NAVFAC Engineering Command. Suggested we obtain publication "Bureau of Naval Ordnance Command Records for WWII". Suggested contacts at National Archives.	No further contact with Naval Operations Archives Branch required.
Facilities Engineer and Lucerne, CA	Tel. 9/20/89 Letter 9/20/89	Dr. Trasano Mr. Mark Keules	They are responding to an information request by Rich Duarte of KC District. They will send us maps.	Written response expected. Information from Duarte expected.
1st of Military History National Research Branch Washington DC	Tel. 9/21/89 Written 9/21/89	Ms. Hannah Zeldlik	They will forward Abstracts "History of Depots and Ordnance Plants". EEI visited on 10/26.	Very little information was obtained. No abstracts were obtained.
Army Corps of Engineers 1st City District	Tel. 9/19/89 Written 9/19/89	Mr. Rich Duarte	Need written request, will respond.	Written response expected.
1st of Military History 1st Barracks, PA	Tel. 9/21/89 Written 9/21/89	Ms. Louise Arnold	Offered to research personnel papers of commanders if given names. Suggests book "Blessed Assurance" concerning Pantex.	Send letter after receiving names of commanders from Personnel Records Center.
HAMA	Tel. 9/21/89	Mr. Conrad Swan	Records search for Nebraska Ordnance Plant available - maybe for other plants.	Offered to supply Archives Report after written request.
Army Installation Support	Tel. 9/22/89	Mr. John Clark	No information available.	No further contact with this organization is necessary.
1st of Military History Army Defense Ammunition 1st and School	Tel. 9/22/89 Written 9/25/89	Mr. John Smith	Commander of this organization was at one of the sites; will call us.	Received letter, no information available.
1st of Military History Army DESCOM 1st of Military History	Tel. 9/25/89	Mr. Ray David	Referred us to Jim Walker (DEP Command, Letterkenny).	No further contact with DESCOM necessary.
1st of Military History Army Arsenal, PA	Tel. 10/2/89	Mr. Bill Alsteadt Mr. Pete Rowland	Send request for information to Bill Alsteadt. Mr. Pete Rowland stated they have no information of the type we are interested in.	Written response expected.

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
in Nebraska Technical e, Sidney, NE	Tel. 10/5/89	Mr. Joe McCann Campus Dean	Stated SAD Museum was on campus. Also, Mr. Ivan Fehringer, Support Services Director had several drawings of SAD.	Visited museum. Contacted Mr. Ivan Fehringer.
Army COE of History (CEHO)	Tel. 10/5/89	Mr. Martin Gordon Archivist	Reviewed data search to date with Marvin. He said our search was complete and we had covered the two areas to look at. 1) National Archives, 2) Ordnance Historians, 3) Regional Archives. Said we should search record groups 338, 77, 156, and 270. Also maps and drawings are kept in separate buildings from text at National Archives.	Recontact if we have any problems or need more help.
Pantex	Tel. 10/6/89	Mr. Gordon Gabert	DOE is still looking for information. Art Thibodeaux is doing data gathering. Already know of seven sites on Texas Tech Property, plus want to look at a few more before we visit. Will be at least a week before they are ready for a visit.	Information package received.
in Nebraska Technical	Tel. 10/9/89	Mr. Ivan Fehringer	Ivan met with Paul Shetley to go through drawings. Will assist us in obtaining copies.	Paul Shetley visited.
HAMA	Tel. 10/11/89	Mr. Conrad Swan	Conrad sent all of the Archive Search Reports USATHAMA contracted for (24) to Bob Nore at Huntsville COE. Suggested if Bob Nore cannot locate them to contact the USATHAMA Technical Information Center at USATHAMA	No further contact with Conrad Swan is required.
ville COE	Tel. 10/11/89	Mr. Bob Nore	Bob will contact Rob Wilcox and anyone else necessary to furnish us with reports. He has NOP (MEAD) he is not sure if Archive Searches exist for the other three sites	Wait for copy of NOP Archive Search
ical Information Center	Tel. 10/11/89	Ms. Mary Samuels	Mary said she would begin looking for the Archive Search reports we require. However, she needs Conrad Swan, of USATHAMA, to submit a request form before she can release any information.	

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
al Personnel Records r - St. Louis	Tel. 10/11/89	Mr. Fred Liggins	Fred said he forwarded one request onto the Records Center Archivist. He has not heard back from all of them yet. He does have some records on Hastings. However, these are mostly hospital treatment records. He will call us back with a progress report in the next few weeks. Mentioned they had found some blueprints.	
al Personnel Records r - St. Louis	Tel. 10/16/89	Mr. Bill Seibert	Considerable information is available. We must request authorization from USAISC Alexandria, VA.	Appointment scheduled for Nov. 13 to review records.
HAMA	Tel. 10/13/89	Mr. Conrad Swan	Conrad said that either he or Harry Dutcher will accompany us to the Technical Information Center (TIC).	Need to contact Conrad and let him know when we will be visiting the TIC.
ny Arsenal	Tel. 10/13/89	Mr. Pete Rowland	Called to clarify what information we needed regarding our letter. He will have his historians and librarians check Picatinny's records and send us a response.	Wait for response to letter.
Energy and nmental Support	Tel. 10/26/89 Tel. 10/27/89	Mr. Tom Flor	No archives searches have been performed for Hastings. He suggests contacts with Regional Archives Officer with COE, Kansas City.	No further contact with NEESA required.
ika National Guard	Tel. 10/13/89	Herb Rood	Information that is available has been furnished to Kansas City COE.	No further contact required.
avy Naval Facilities ering Command Office rotonal Safety & Health	Tel. 10/25/89	Ted Zagrobelay	Suggests contacting NEESA, Patricia Gandy or Tom Flor	
A Environmental oring Systems Lab egon, NV	Tel. 10/26/89	Phil Arberg	No aerial photos available for Sioux or Panter. Only one copy of report available for Hastings and Mead.	He suggests we photograph the reports in Kansas City.
OE	10/10/89 Tel.	Rick Durante Kathy Older	Explained our SOW, not willing to cooperate until they have checked with Huntsville COE	Pending
i County	10/10/89 Tel.	Christine Johnson Deputy Sheriff	Set up an appointment to meet on Thursday 10/12/89	
i Office	10/10/89 Tel.	Mike Shada	Set up an appointment to talk about SAD on Wednesday, 10/11/89	
a COE	10/10/89 Tel.	Linda Wagner	Set up an appointment for Friday, 10/13/89 to talk about SAD	
NE Technical	10/10/89 Tel.	Ivan Fehring		

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Organization	Contact Date(s)	Contact Name	Results	Status
1. COE	10/11/89 Per. PWS	Linda Wagner	Discussed SAD, received list of land owners and map	Willing to help if she can as project progresses
2. County Office	10/12/89 Per. PWS	Deputy Sheriff Mike Shada	Drove to Civil Defence Office, Introduced PWS to Terry Marshall, Director of CD, also drove into NAD to view site	Mr. Shada could only act as a guide, orders of the sheriff
3. Adams County Preparedness	10/12/89 Per. PWS	Terry Marshall CD Director	Met Mr. Marshall at CD headquarters. Viewed maps, photos, and reports compiled by T. Marshall. Received map of NAD from city engineer, 3x5'	Mr. Marshall is very knowledgeable about the site. Very willing to share verbal information, but not written information.
4. County Historical Society	10/12/89 Per. PWS	Kathrin Renschler Curator	Reviewed documents in Historical Library. History of NAD, newspaper articles and small maps.	
5. County SCS	10/12/89 Per. PWS	NA	Received copy of soil survey of Adams County	
6. Hastings, Nebraska Technical	10/12/89 Per. PWS	J.E. Harper Assistant City Engineer	Received blue print copy of NAD map	
7. Nebraska Technical	10/13/89 Per. PWS	Ivan Fehringer, Director of Support Services	Sorted through drawers of SAD drawings. Brought back 15 drawings to copy.	Does not have a lot of personal knowledge of SAD
8. Nebraska Technical and Land Owner of NE SAD	10/13/89 Per. PWS	Rob Franzca	Drove onto SAD and visited Areas, R, E, & U. found probable UXO and ordnance debris also denuded areas and landfills. Took Pictures.	Very helpful; will act as guide for next trip.
9. DOE	10/16/89 Tel. PWS	Kathy Older	She has worked out most of her differences with Hugisville	I will visit her at KC COE office on Friday, October 20.
10. DOE	10/16/89 Tel. PWS	Gordon Gabert	He has the information compiled for us.	Will meet with him on Thursday, October 19 at Pantex
11. DOE, COE & Hanger	10/19/89 Per. PWS	Gordon Gabert-DOE Russel Holeman-COE C.B. Lowery-M&H J. Burling-M&H H.W. Licht-M&H Art Thibodeaux-DOE	Meeting where SOW was explained. Mr. Thibodeaux gave presentation on history of Pantex and results of his recent field investigation. Visited production lines, landfills and burning ground.	M&H is willing to assist. COE is now the POC. Found chunks of TNT in production areas. Very little ordnance debris, mostly dunnage.
12. County SCS	10/19/89 Per. PWS	Julius Purnell	Received soils field sheets and soils name/unit list and aerial photos	Aerial photos quality poor
13. County Square House in, Panhandle, TX	10/20/89 Per. PWS	Lequita Hunt Office Manager	Reviewed 4 volumes of Carson County history, "A Time and Purpose: A Chronicle of Carson County". All information in book was on families and their association with Pantex.	Copied index sheet with Pantex citations

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
City COE Geology Section and Branch	10/20/89 Per. PWS	Carrol McKinney Millard Stone Christine Johnson Kathy Older Phil Keary	Geologists & engineers working on NOD and NAD. Received information on NOD and NAD, "Chemical Ref. Handbook"; summary of interviews with former NOD employee, maps, copies of photos. POCs for NOD and Hastings. Reviewed Bureau of Ordnance Records, Naval records; copied several relevant documents.	Invited return visit, COE wants to coordinate any work at sites.
al Archives d, MD	10/22/89 to 10/26/89 Per. PWS/DRM	Richard Boylan Laura Banus	Reviewed Bureau of Ordnance Records, Naval records; copied several relevant documents.	Reviewed all known pertinent record groups.
al Archives ation, D.C.	10/25/89 Tel. PWS	Richard Von Doerhoff	Suggested record group for Navy records	Records were at Suitland
Historical Center	10/25/89 Tel. PWS	Gene Akers	Suggested Bu S and A records for Naval information. Will send summary of Hastings history.	Records at Suitland, no pertinent information found.
of Military History	10/25/89 Tel. PWS	Mark Wilner	Made appointment at CHM for 10/26/89	
al Archives raphic Center	10/25/89 Tel. PWS	Archivist 1980	Have aerial photos available from 1940 - 1960.	Some aerial photos same as ordered from USDA.
of Military Washington, D.C.	10/26/89 Per. PWS/DRM	Mark Wilner Kim Hollan	Reviewed documents, talked with historians, copied glossary of ordnance terms.	Willing to give future assistance.
Army Museum of Ordnance	10/27/89	-	Visited museum, observed exhibits on ordnance types.	-
Sea Proving Ground, MD	Per. PWS/DRM	Mark Corriston	Kansas City Records Center contains no record groups related to ordnance.	-
al Archives a Center, K.C., MO	10/30/89 Tel. PWS	Mark Corriston	Discussed copying (photographing) the EPIC lab aerial photos. Mr. Stone needed clearance from EPA for us to copy. Provided EPA POC.	Call back after talking with EPA.
City COE	10/31/89 Tel. PWS	Millard Stone	Discussed copying the EPIC aerial photos. Stated that there is no problem in copying the aerial photos.	Mr. McCabe stated that he would call Mr. Stone with COE to OK the copying of photos.
Consulting Associates na, NE	10/31/89 Tel. PWS	Greg McCabe Karla Knaapp	Trying to site a water supply well for Sidney, NE. Has visited site and interviewed a former employee and Mr. Beyer.	Interested in coordinating with us on site visit.
City COE	11/1/89 Tel. PWS	Millard Stone	He received no phone call from Greg McCabe at EPA.	Will call EPA upon arrival at Kansas City COE.
City COE	11/1/89 Per. PWS/WWM	Katherine McKinney	Received permission to copy EPIC aerial photos. Shot 4 rolls of B&W and 2 rolls of color to copy NOD and NAD aerials.	
EPIC Labs egas, NE	11/2/89 Tel. PWS	Phil Aberg Clay-----	Checked on text associated with Hastings Report. He had no information.	Suggested calling the USEPA in Kansas City or COE.

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
Historical Center	Mail/PWS	Gena Akers	Received historical summary as promised 10/25/89	
Ward NAD	11/6/89	Al Ward	Received call from Mr. Ward. Concerned with our work schedule.	Will meet us on site during visits.
Owner	Tel. PWS			
Amarillo Office	9/23/89	Russell Holeman	Sent 4 volumes of industrial inventories (Panter)	Received the 4 volumes.
	Tel. ND		Ask for a copy of 1983 DOE EIS	Have not heard back as yet.
	10/2/89			
	Tel. ND			
Initiation Center	10/3/89	Jerry Loomney	Meeting with Bouilly to obtain as-built drawings	
	Tel. ND			
Initiation Center	10/3/89	Bob Bouilly	Will meet on Monday	
	Tel. ND			
	10/6/89	Bob Bouilly	Went over what was available. Will copy the "as-built drawings" and other miscellaneous articles and maps.	Very willing to help locate pertinent information.
	Tel. ND			
Missouri Records Center	11/13/89 to	Bill Siebert	Reviewed numerous boxes of records on NOP,	Reviewed all pertinent and available.
Missouri, MO	11/15/89	John Bernoske	POP, SAD and Ordnance Command. Copied several able records groups.	
	Per. PWS/ND	Mary Palmer	photos and documents.	
		Karl Paulsen		
Facilities Engineering and	11/14/89	Dolores Knight	Discussed possible trip to Port Hueneque, CA to review records on NAD.	Trip cancelled, limited information available. Navy will mail us information.
	Tel. TML/PWS			
Nebraska Community	11/16/89	Rob Franzan	Set up schedule to meet with him the week of Dec. 4th.	He is available to meet with us throughout the week.
	Tel. PWS			
Nebraska Community	11/16/89	Duane Lewis	Asked him about his uncle who worked at SAD (Ed Maul).	Got his uncle's phone number in evening. Also got other names of former SAD workers.
	Tel. PWS			
Nebraska Community	11/16/89	Jim Dimick	Reported to have worked at SAD.	Did not work for SAD. Referred me to Betty Hoven.
	Tel. PWS			
Nebraska Community	11/16/89	Betty Hovea	Worked at SAD in communication 1947 - 1962.	Provided more names to contact. No knowledge of munitions work at SAD.
	Tel. PWS			
SAD Employee	11/16/89	Don Chooa	Worked at SAD from 1950 to 1967.	Willing to meet with us on site in December.
	Tel. PWS			
-USDA	11/17/89	Bob Adamson	Called about problems with aerial photo order.	He stated he would get back to us on Monday, 20th.
	Tel. PWS			
SAD Employee	11/17/89	Ed Maul	Interviewed about workings of SAD.	Referred me to Lois O'Hare, organizer of SAD reunion.
(Lewis' Uncle)	11/17/89			
Consultants	11/17/89	Karla Knapp	Discussed scheduling a meeting during week of Dec. 4th.	Will meet us at SAD on 5th or 6th in PM.
432-6385	11/17/89			
	Tel. PWS			

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
Army of SAD reunion	11/17/89 Tel. PWS	Mrs. Jack Wright	Reported to head-up the SAD reunion. She does not head-up the SAD reunion.	Referred me to Lois O'Hare (308) 235-2401
	11/17/89 Tel. PWS	Lois O'Hare	Interviewed her and she provided me with many names of former employees.	
	11/17/89 Tel. PWS	Tom Smith	Presumed too ill to talk on phone.	Will not call back.
COM at SAD	11/20/89 Tel. PWS	Col. C.P. Williams	Interviewed him about SAD.	Will send us copy of SAD History Book when found.
COM SAD Employee	11/20/89 Tel. PWS	Charles Smith	Interviewed his about SAD for approximately one hour.	Very knowledgeable at SAD and munitions operations.
in Nebraska Community	11/21/89 Tel. PWS	Rob Franzen	Made preliminary arrangements to meet on Dec. 5.	
WNER at SAD	11/21/89 Tel. PWS	Leon Kriessel	Interviewed about property.	Will meet 12/6/89 at 9:00 am.
WNER at SAD	11/21/89 Tel. PWS	Alfred Jung	Interviewed about property.	Will meet 12/5/89 in pm.
WNER at SAD	11/21/89 Tel. PWS	Richard Stahl	Interviewed about property.	Mr. Stahl leases Walter Hilpert's land. No need for meeting.
WNER at SAD	11/22/89 Tel. PWS	Roger Franzen	Interviewed about property.	Meeting 12/6/89 at 1:00 pm.
WNER at SAD	11/22/89 Tel. PWS	Norman Steffens	Interviewed about property.	Meeting 12/7/89 at 9:00 am.
WNER at SAD	11/22/89 Tel. PWS	Leonard Beyer	Interviewed about property.	Meeting 12/7/89 at 1:00 pm.
WNER at SAD	11/27/89 Tel. PWS	Raymond Leesman	Interviewed about property.	Will meet with him if needed during week of Dec. 4.
Environmental Research Station	11/8/89 Tel. NMD	Nancy Austin	Will send microfiche report on explosives.	Received.
Amarillo	11/8/89 Tel. NMD 11/13/89 Tel. NMD	Russell Holeman Getting ready for site visit.	Information on Webster's Reagent.	Received.
COM	11/13/89 Tel. NMD 11/15/89 Tel. NMD	Bob Bouilly Bob Bouilly	Has maps, will send. New contacts, information on disposal of chemical ordnance	Received.
Tech	11/16/89 Tel. NMD	Hilton Wilson	Information on site wants letter of intent.	
COM	Written	Hilton Wilson	Letter of intent.	
Field Safety	11/16/89 Tel. NMD	Bob Bouilly	Ordnance Safety Manual.	
Explosive	11/17/89 Tel. NMD	John Campbell	1945 Safety Manual.	Received.
Explosive Disposal Tech.	11/17/89 Tel. NMD	Mary Wolfson	Ordnance information.	None pertinent.
COM	11/17/89 Tel. NMD	Maria O'Mara	Additional contacts.	
State National Guard	11/17/89 Tel. NMD	Jerry Loomer	Contacts.	
Explosive Safety Board	11/17/89 Tel. NMD	Mr. Dixon	Contacts.	
Amarillo	11/17/89 Tel. NMD	Gene Clark	Contacts.	
	11/17/89 Tel. NMD	Russell Holeman	Coordinate for site visit.	

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
to Emergency	11/21/89 Tel. NMD	Mr. Kelly	No information.	
ement				
to Library	11/22/89 Tel. NMD	Art	No information.	
OM	11/21/89 Tel. NMD	Bob Bouilly	Further information.	
e Ammo Directorate	11/21/89 Tel. NMD	Jerry Holt	No information.	
OM Plant Operations	11/21/89 Tel. NMD	Mr. Ghase	Will look for information.	
OM Publications	11/21/89 Tel. NMD	Don Braddock	Additional contacts	
anter	11/27-11/29 Site	Gordon Gabert	Security information	
	NMD, TML, JRT			
Amarillo		Russell Holeman	Site information.	
Tech		Hilton Wilson	Site information.	
POP Worker	Tel. NMD	Wayne Wester	No information.	
DOE Employee		Carl Webb	No information.	
S	11/28/89 Visit	Brad Fields	Received 1967 and 1979 photos	
	NMD, JRT	Eddie Winecard	of site.	
So. Museum	Visit	Don Markham	Additional contacts.	
POP Employee		Wilma Peterson	Information on Zone 9.	
DOE Employee	11/28/89 Tel. NMD	Bob Rollen	Information on POP.	
POP Employee	11/28/89 Tel. NMD	Anna Klink	No information.	
POP Employee	12/1/89 Tel. NMD	Rita Hearick	No information.	
Amarillo	12/1/89 Tel. NMD	Russell Holeman	Information on POP, will send	Received.
			DOE Health and Safety	
OM	12/1/89 Tel. NMD	Bob Bouilly	Information on flashing beds	
		Ralph Kripper	or pans.	
al Archives	12/1/89 Tel. NMD	Stuart Butler	Will find area, send letter.	Letter sent. POP articles found.
Section				
OM	12/4/89 Tel. NMD	Mr. Ghase	Additional contact.	
POP Employee	12/4/89 Tel. NMD	Bob Markham	Some information on production.	
Petroleum	12/4/89 Tel. NMD	Dennis Haley	Original lease information (Bldg. 9-7)	
DOE Employee	12/4/89 Tel. NMD	Marion L. Ott	Clean-up of TNT at Zone 9 in 1951.	
Bureau of Economic	12/4/89 Tel. NMD	Publications	Ordered Amarillo Quad.	Received.
TV				
Huntsville	12/5/89 Tel. NMD	Rob Wilcox	Notified about desired changes.	Wrote letter. Have heard nothing 1/29.
Huntsville	12/5/89 Tel. NMD	Scott Bradley	Sampling information.	Sent letter. No answer.
Huntsville	12/5/89 Tel. NMD	Dale Campbell	Modification information.	
Tex Tech Farm	12/5/89 Tel. NMD	J.P. Smith	Information on site.	
ref				
POP Employee	12/5/89 Tel. NMD	Thelma Lang	Site information	

TABLE
SUMMARY OF RECORD SEARCH INQUIRIES
(continued)

Location	Contact Date(s)	Contact Name	Results	Status
COM	12/6/89 Tel. NMD	Bob Bouilly	Burning ground information.	
Clute Ammo Plant	12/6/89 Tel. NMD	Barbara Kartsema	Will send publication.	Letter sent. Received.
Huntsville	1/7/90 Tel. NMD	Scott Bradley	Pb Sampling information.	Gave his OK. Said he would send method.
Tech	1/2/90 Tel. NMD	Hilton Wilson	Information on crops and irrigation.	
COM	1/12/90 Tel. NMD	Bob Bouilly	Records information.	
Huntsville	1/12/90 Tel. NMD	Scott Bradley	Picrate information. He will send for method.	Old Method received for water. Water for new method.
Huntsville	1/12/90 Tel. NMD	Jim Ferris	Cannot find who has POP. Nothing done on changes.	Expecting to hear from someone.

ATTACHMENT G-2 – Supplementary Archives Search Report References

TABLE 2-1

INFORMATION SOURCES USED DURING THE 1993 SASR AT THE FORMER NEBRASKA ORDNANCE PLANT

Organization	Contact Dates	Contact Name	Results	Status
U.S. Army Military History Institute Attn: Research & Reference Branch Carlisle Barracks Carlisle Barracks, PA 17013-5008 (717) 245-3152 (717) 245-3631	Tele. 6/7/93 Tele. 6/8/93 Letter 6/22/93	Pam Cheney Randy Rakers	Received additional contacts. Letter received 7/6/93. Sent limited information. Have some CWM documents.	Visited 7/27/93 General Information Only
AMCCOM Headquarters AMSMC-HO Rock Island, Illinois 61299-6000 (309) 782-1276	Tele. 6/4/93 Letter 6/22/93	Dr. Herb LaPore	Additional contacts. Received letter 7/6/93. No information available.	No further contact required.
SAIC 1309 Continental Drive Suite F Abingdon, MD 21009 (410) 679-8014 Fax (410) 679-0356	Letter 6/23/93 Fax 6/23/93	Eric Azuma	Received documents 6/24/93.	Call if need additional assistance.
GSA-FOIA 18th and F Street Washington, DC 20402 Attn: Dick Stinson (202) 501-2069 (202) 501-2938	Tele. 6/4/93 Letter 6/23/93 Fax 6/23/93 Tele. 6/23/93 Tele. 7/7/93 Tele. 7/13/93	Gloria McDonald Leslie Carrington Mae Simms	Have done a thorough search. Have no records on NOP. Reviewed BHAD records in 1992. Later, on 7/13, additional records were identified.	Visited GSA 7/14/93 Reviewed additional GSA documents 7/17/93 and 7/26/93
Department of the Army Freedom of Information Office Headquarters USA-ISC-P (ASQNS-OP-F) Crystal Square, #2 Suite 201 1725 Jefferson Davis Highway Arlington, Virginia 22202 Attn: Ms. Edie Miley (703) 607-3452 Fax (703) 607-3450	Tele. 6/11/93 Letter 6/23/93 Fax 6/23/93 Tele. 6/23/93 Tele. 6/24/93 Tele. 6/28/93 Tele. 7/7/93	Steve Ellidridge Marian Friend	Faxed master list of documents. Selected pertinent items. Will fax permission to review documents to Suitland 7/8/93.	Reviewed records week of 7/12/93.

TABLE 2-1

INFORMATION SOURCES USED DURING THE 1993 SASR AT THE FORMER NEBRASKA ORDNANCE PLANT

Organization	Contact Dates	Contact Name	Results	Status
Chemical School Library ATZN-CM-FI Ft. McClelland, AL 36205-5020 (205) 848-5722 (205) 848-4414	Tele. 6/4/93 Letter 6/22/93	Dr. Dan Spector Dick Pastorett	Very unorganized documents. Will pass the names of sites to visiting contractors.	Contact as needed.
Commander U.S. Army Dugway Proving Ground Attn: JCP-1 (Ron Stricklett) Dugway, Utah 84022 (801) 831-3565	Tele. 6/7/93 Letter 6/23/93	Steve Christiansen	Letter received 6/28/93. Four documents on BHAD are available.	Received first of documents 8/11/93. USACE will supply the two chosen
U.S. Army Chemical Material Agency Attn: SFIL-NSP Aberdeen Proving Ground Aberdeen, MD 21010-5410 (410) 671-1083	Tele. 6/23/93 Tele. 6/24/93 Letter 6/25/93	Mr. Skinner Wayne Jennings	Call Eric Azuma (401) 679-8014. Can ask and obtain access to the library.	Call if need additional assistance.
Suitland References (NNRI) National Archives Washington, DC 20409 (301) 763-7411	Tele. 6/23/93 Tele. 7/7/93	Mr. Giordano Becky Collier	Write letter requesting declassification of Box 18 and 179 Documents copied. 1-8 not found	Reviewed documents week of 7/12/93 and 7/26/93
EOD Offutt AFB (402) 294-3232	Tele. 6/7/93	Sgt. Major Patterson	Offutt EOD unit closing down. They have no records of NOP on file.	No further contact required.
CEHND Safety Office (205) 955-4583	Tele. 6/11/93	Wayne Galloway	Supplied number for 94th EOD	Call as needed.
94th EOD Ft. Carson, CO (719) 579-4242	Tele. 6/11/93	Master Sgt. Van Huss	New EOD/CT is 548th EOD in Ft. Lewis, WA. Does not have the number.	Call before going to the sites.

TABLE 2-1 INFORMATION SOURCES USED DURING THE 1993 SASR AT THE FORMER NEBRASKA ORDNANCE PLANT					
Organization	Contact Dates	Contact Name	Results	Status	
Commander U.S. Army Chemical and Biological Defense Agency AMSCB-CIH (Jeff Smart) Aberdeen Proving Ground Aberdeen, MD 21010-5423 (410) 671-4430	Tele. 6/24/93 Letter 6/25/93	Jeff Smart Cathy Chiofi	Copied numerous documents require letter requesting clearance from USACE. USACE will send letter	Visited 7/15/93	
USACE, Omaha District Omaha, NE (401) 221-7851 (402) 221-7643 (402) 221-4395 (402) 221-3801	Tele. 6/25/93	Linda Wagner Jerry Smith Alice Daniel Bev Walling	25 volumes of real estate information on NOP. These records were reviewed on August 3, 1993. Documents copied	Central Park Plaza South Tower. 222 South 15th St. Room 302. No further contact.	
U.S. Army Environmental Hygiene Agency AHN-HSHB-CCI/Ms. Anders Building E 1570 Aberdeen Proving Ground, MD 21010-5422 (410) 671-4408	Tele. 6/28/93 Letter 6/28/93	Ms. Anders	Received several documents relevant to NOP or BHAD.	No further contact	
Ordnance Field Safety Office 1145 Highway 629 Charleston, IN 1711-966 (812) 284-7915	Tele. 6/24/93 Tele. 6/28/93	John Campbell	Safety Office no longer active.	No further contact required.	
U.S. Army Environmental Center ENAE-IR-D Aberdeen Proving Ground Aberdeen, MD 21010-5401 (410) 671-1534 Fax (410) 671-1548	Tele. 6/24/93 Letter 7/2/93 Tele. 7/6/93	Conrad Swan	Referred letter to Joe King. Records sent to CEHND.	No further contact required.	

TABLE 2-1

INFORMATION SOURCES USED DURING THE 1993 SASR AT THE FORMER NEBRASKA ORDNANCE PLANT

Organization	Contact Dates	Contact Name	Results	Status
NCPMO National Records Center 9700 Page Avenue St. Louis, MO 63114 Attn: Mr. David Petree (314) 538-4216 Fax (314) 538-4005	Tele. 6/4/93 Letter 6/23/93 Fax 6/23/93 Tele. 6/23/93 Tele. 6/25/93 Tele. 6/28/93	Bill Siebert Wilson Sullivan	Documents on BHAD obtained. Five boxes of records on Offutt reviewed. Five folders shipping records on Offutt also reviewed. No information related to CWM disposal sites at NOP. Additional records reviewed 9/93.	Record Center Visit 6/29 - 7/1/93. Additional visit to review Air Force records on 8/10.
U.S. Army Corps of Engineers St. Louis District (314) 331-8787	Tele. 6/4/93 Tele. 6/28/93 Visit 6/28/93 Visit 7/2/93 Tele. 7/6/93	Captain Tom Murrell	Obtained contacts and provided necessary coordination, information requests, and letters of introduction.	Contact as needed.
Surety Office Headquarters AMCCOM Attn: AMSMC-SR Rock Island, IL 61299-600 (309) 782-2965	Tele. 6/23/93 Letter 6/23/93	Russell Hartwig (Safety Office)	No information available.	No further contact.
History Resources Branch The Center of Military History 1099 14th Street Northwest Washington, DC 20005-3402	Letter 6/22/93	Hannah Zeidlik	Received limited information	No further contact required
Former Offutt Safety Officer Offutt AFB	Tele. 6/28/93	John Jurgiel	Interviewed on telephone.	Contact as needed.
Offutt AFB Disaster Preparedness (402) 294-5527	Tele. 6/28/93	Sgt. Cole	Referred to Environmental Office	No further contact needed.
Offutt AFB Environmental Office (402) 294-4037	Tele. 6/28/93 Tele. 7/2/93 Fax 7/2/93	Mr. Kemp Ed Lueninghoener	Sent map with notations of chemicals (Offutt AFB). Requested information from CESTL.	Contact as needed.

TABLE 2-1

INFORMATION SOURCES USED DURING THE 1993 SASR AT THE FORMER NEBRASKA ORDNANCE PLANT

Organization	Contact Dates	Contact Name	Results	Status
Command General Staff Library Ft. Leavenworth, KS (913) 684-4035	Tele. 7/2/93	Tina Byers	Provide them with more detailed document information. Need the names on the documents required.	
National Archives Washington, DC (202) 501-5395	Tele. 6/4/93 Tele. 7/7/93 Tele. 7/19/93	Tab Lewis	No information. All information in accession #58A542 sent to Kansas City. May be some information in GSA Central Files.	Call when in Washington, D.C.
Headquarters, US Army Garrison Public Affairs Office Ft. Detrick, Md. 301-619-8000	Tele. 7/13/93	Norman Covert Chief, Historian	He checked his file listing; they have nothing on these sites. His organization (formerly USABRDL) was mostly involved in biological R&D.	He suggested contacting Edgewood Arsenal.
US Army Corps of Engineers Huntsville Division Huntsville, Alabama 205-955-5802	Tele. 7-13-93	Rob Wilcox	Described incident at NOP. Reportedly mustard canisters were found on train in Omaha. Taken by Offutt AFB unit to NOP. Buried in gully 4' to 6' deep. later uncovered, causing a green cloud.	Will fax us documentation of the incident. No response to date.
SAF/AAIA 1610 Air Force Pentagon Washington, DC 20330-1610 703-614-3527 703-693-1713	Tele. 7-13-93 Fax 7-13-93 Tele. 7/19/93 Tele. 7/21/93	Grace Rowe	TCT requested access to five boxes of records at St. Louis Personnel Records Center. Received permission to review documents	Reviewed records 8/10/93
National Archives Regional Archives Kansas City, Mo. 816-926-6272 816-926-6982 fax	Tele. 7-19-93 fax 7-15-93	Clara Rolen	She indicated records were available for review.	Records review was performed on August 2, 1993.

TABLE 2-1 INFORMATION SOURCES USED DURING THE 1993 SASR AT THE FORMER NEBRASKA ORDNANCE PLANT				
Organization	Contact Dates	Contact Name	Results	Status
Univ of Nebraska Agri. R & D Center 402-624-2275 402-625-2591 fax	Tel. 7-22-93 In person interview 8-23-93 & 8-26-93	Richard "Mac" McManamen, Facilities Mgr.	Discussed incident of encountering green gas during excavation and reports of buried mustard gas. Suggested interview with Chick Hastert. Reviewed 1987 aerial photos and maps from 1947.	No further contacts.
Private Individual 402-443-3671	Tele. 7-22-93 In person interview 8-24-93	Chick Hastert, former Civilian in Charge of NOP and Facilities Mgr for Univ of NE Agri. R and D Center, retired.	Discussed Mustard burial incident and other operation of the NOP and at the Agri. R & D Center.	No further contacts.
Land owner and farmer 402-624-6215	Tele. 8-23-93 Tele. 8-24-93	Eldon Johnson, farmer and owner of former South Burning Ground.	He stated that he has never found any ordnance of pieces of ordnance. Has no knowledge of CWM. Obtained verbal permission to inspect former So B.G.	No further contact
Support Maintenance Center (SMC) Nebraska National Guard	Tele. 8-23-93 In person interview 8-24-93	Tom Sladek Chief Warrent Officer	He has no knowledge of any UXO or CWM being buried or disposed of at the former NOP.	No further contact.
Nebraska Natural Resources District, Lower North Platte. Wahoo, NE.	In person interview 8-25-93	Larry Angle, Water Quality Specialist	No knowledge of any encounters with CWM during the construction of the pond near the No. Burning Ground. Referred us to Randy Gunn with the SCS.	No further contact.
Private Individuals	In person interview 8-25-93	Harry and Twila Berman, former workers at the NOP	Neither had any knowledge of the disposal of CMW at the NOP. Twila Berman also worked for the Univ. of NE until recently.	No further contact.
Saunders County Historical Society Wahoo, NE	In person visit to Museum 8/25/93	Deborah F. Playfair, Historian/Curator	Reviewed Old NOP operational photos and maps. Copied photos and map.	Ms. Playfair provided us with more names of former NOP workers.

TABLE 2-1 INFORMATION SOURCES USED DURING THE 1993 SASR AT THE FORMER NEBRASKA ORDNANCE PLANT					
Organization	Contact Dates	Contact Name	Results	Status	
Private Individual 1007 W. 9th Wahoo, NE 402-443-3348	Tele. 8-26-93	Rudy Rezek, former worker at NOP from 1947 to 1956.	He had no knowledge of CWM or ordnance demolition/detonation.	No further contact.	
Private Individual 107 S. Elm Mead NE 402-624-3155	Tele. 8-26-93	Everette Hilfilker, former Captain on NOP Fire Dept.	No knowledge of CWM present at NOP and is "fairly confident of his assessment".	No further contact.	
Saunders County Soil Conservation Service Wahoo, Nebraska.	In person interview 8-26-93 Tele. 8-30-93	Randy Gunn, Soil Scientist	The SCS records of the borings made prior to the building of the reservoir, contained no records of encountering any CMW or UXO.	No further contact.	

REFERENCES
FORMBER NEBRASKA ORDNANCE PLANT
SASR 1993

NOPb-001	TCT-St. Louis, Final Engineering Report, Preliminary Assessment of Ordnance Contamination at the Former NOP, Mead, Nebraska, April 1991
NOPb-002	U.S. Army Corps of Engineers, Interim Removal Action; NOP, February 21, 1991
NOPb-003	Offutt AFB Swimming Pool Layout Map with Notes, May 10, 1959
NOPb-004	U.S. Army Corps of Engineers, Fact Sheet, undated circa 1992
NOPb-005	Chief of Engineers, Owned, Sponsored and Leased Facilities, undated
NOPb-006	NOP, Semi-Annual Historical Report, NOP, Destruction of Components, Volume 14, January-June 1946
NOPb-007	NOP, Monthly Surveillance Report, April 1949
NOPb-008	NOP, Monthly Surveillance Report, June 1947
NOPb-009	NOP, Monthly Surveillance Report, April 1948
NOPb-010	National Gypsum Company, History of NOP, Wahoo, Nebraska, June 30, 1951
NOPb-011	Description of NOP, October 3, 1951
NOPb-012	NOP, Industrial Installation Data, September 1951
NOPb-013	NOP, Personnel Utilization and Production Schedule, 1952
NOPb-014	NOP, Production Schedule, 1953
NOPb-015	NOP, Production Schedule 1954
NOPb-016	NOP, Production Schedule, September 1955
NOPb-017	National Gypsum Company Excerpts from Phase I Study of NOP, September 15, 1950
NOPb-018	GSA, Aerial Photos, NOP undated
NOPb-019	USACE, MRD, Lease Map, NOP, 1954
NOPb-020	GSA, Supplement to Report of Excess Real Property Buildings and Structures, undated
NOPb-021	GSA, Facility Map showing Disposal and Some Areas of Contamination, undated

<p style="text-align: center;">REFERENCES FORMBER NEBRASKA ORDNANCE PLANT SASR 1993</p>	
NOPb-022	Henry Hrdlicka, Personal Correspondence on Land Purchase, NOP, undated
NOPb-023	GSA, Disposal Documents, NOP, 1959
NOPb-024	GSA, Memorandum for the Record, NOP, October 11, 1960
NOPb-025	GSA, Disposal Documents, Airforce and Army Need for Some NOP Land, 1959
NOPb-026	GSA, Property Disposal Documents, NOP, 1961
NOPb-027	University of Nebraska, Property Acquisition, NOP Documents, 1961
NOPb-028	Department of the Army, Property Disposal Documents, NOP, 1961
NOPb-029	Facility Maps, NOP 1959
NOPb-030	Zimmerman Warren "NU Chances to Get Mead Land Improved" Lincoln Journal, June 1960
NOPb-031	GSA, Letter to Business Manager, University of Nebraska, January 26, 1962
NOPb-032	GSA, Proposed Conveyance of Nebraska Ordnance Plant to University of Nebraska, undated
NOPb-033	Key Personnel at NOP, undated
NOPb-034	Facility Map, NOP, 1956
NOPb-035	Ordnance Department Memo to Inspector General "NOP of Salvage Functions to Offutt AFB", July 1, 1949
NOPb-36	National Gypsum, History of NOP, Wahoo, Nebraska, First Semi-Annual Report for year 1955
NOPb-37	National Gypsum History of NOP, Wahoo, Nebraska, Second Semi-Annual Report for Year 1955
NOPb-38	National Gypsum, History of NOP, Wahoo, Nebraska, First Semi-Annual Report for Year 1956
NOPb-39	National Gypsum, History of NOP, First Semi-Annual Report for Year 1957
NOPb-40	National Gypsum, History of NOP, Second Semi-Annual Report for Year 1957

REFERENCES
FORMBER NEBRASKA ORDNANCE PLANT
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NOPb-41	National Gypsum, History of NOP, First Semi-Annual Report for Year 1958
NOPb-42	National Gypsum, History of NOP, Second Semi-Annual Report for Year 1958
NOPb-43	Memo, Government Sale at Public Auction, NOP, Mead, Nebraska, Specifications, Terms and Conditions" - December 13, 1961, 13 pages. Describes 20 parcels auctioned to private individuals.
NOPb-44	Report of Excess Real Property dated 2/25/59, U.S. Army Engineer District, Omaha, Nebraska, 2 pages. Identifies 67 buildings withdrawn from sale because they were on property required for missile silos.
NOPb-45	Report of Excess Real Property dated 6/16/58, U.S. Army Engineer District, Omaha, Nebraska, 2 pages. Excess 4.033 acres adjacent to Morningside Cemetery.
NOPb-46	Letter - United States Department of the Interior National Park Service to General Services Administration dated 6/8/1960, 1 page. Summarizes dispersal of former NOP to various categories of buyers.
NOPb-47	Draft of Teletype to Central Office of Information, Washington, D.C. dated 11/8/61, 1 page. Summary of 12/13/61 sale.
NOPb-48	Report of Excess Real Property dated 9/10/56, 5 pages. 40-acre parcel includes land use regulations.
NOPb-49	Newspaper article "Mead Land Will Be Up For Auction" dated 1/14/61, 1 page.
NOPb-50	Newspaper article "Officials Discuss Acreage Transfer" , no date, 1 page.
NOPb-51	Newspaper article "GSA to Sell Farm Land", Omaha, 11/12/61, 1 page.
NOPb-52	Newspaper article - Omaha World-Herald dated 11/27/61 "U.S. Will Sell 5,000 Idled Mead Acres", 1 page.
NOPb-53	Letter - General Services Administration Demilitarization and Disposal Service to General Services Administration dated 12/19/51, 3 pages. Re: Nebraska Ordnance Place, Mead, Nebraska - Appraisal Revised of Parcels 2, 9, & 20. Identifies "waste land" on certain parcels for sale.

<p style="text-align: center;">REFERENCES FORMBER NEBRASKA ORDNANCE PLANT SASR 1993</p>	
NOPb-54	Memo re: Leases, undated, 2 pages.
NOPb-55	Letter - E.G. Erickson Johnson-Erickson Eng. C; Subject: NOP property boundary survey. Defines parcels for sale. To Chief, Real Property Division, General Services Administration, dated 10/2/61, 8 pages.
NOPb-56	Handwritten memo, "Contaminated area for sale to State for \$1.00", signed J.F., dated 11/2/61, 2 pages. Describes acreage and buildings affected.
NOPb-57	Letter - C.S. Donaldson, Business Manager, University of Nebraska dated 9/25/62 to Mr. J. Wayne Harrey, General Services Administration, Kansas City, MO, re: Supplemental Quitclaim Deed - Nebraska Ordnance Plant (Mead) Contaminated Areas, 8 pages.
NOPb-58	Letter - F.J. Craig, Assistant, Headquarters Ordnance Ammunition Command, U.S. Army Joliet, IL to General Services Administration, Kansas City, MO dated 8/5/60. Subject: Trip report to NOP; review of alternatives for disposition of contaminated areas and buildings. 7 pages.
NOPb-59	Memo from Chief, Midwest Branch Disposal Division; Subject: Nebraska Ordnance Plant, Cost of Decontamination, dated 5/26/60, 1 page.
NOPb-60	Newspaper article "Contamination Slowing Decision on Mead Land" Lincoln Journal, Lincoln, Nebraska, dated 10/22/60, 1 page.
NOPb-61	Newspaper article "Mead Plant Contamination is GSA Concern", Wahoo Newspaper, Wahoo, Nebraska, dated 10/27/60, 1 page.
NOPb-62	Quitclaim Deed dated 4/12/62, property acquired by University of Nebraska, 11 pages.
NOPb-63	Letter - Missouri River Division Corps of Engineers, Chief Real Estate Division to Regional Director, General Services Administration, Kansas City, MO. Subject: Report of Excess Property, NOP, dated 12/18/59, 3 pages.
NOPb-64	Revision - Nebraska Ordnance Plant, Wahoo, Nebraska, (Land to be Disposed of by the Government) - Describes parcels excerpted from Sale of 20 Parcels, no date, 7 pages.
NOPb-65	Report of Excess Property, NOP, GSA, dated 5/60, 21 pages. Identifies explosives-contaminated buildings.

<p style="text-align: center;">REFERENCES FORMBER NEBRASKA ORDNANCE PLANT SASR 1993</p>	
NOPb-66	"Transfer of Real Estate Nebraska Ordnance Plant" 9/29/61, to be transferred to Department of Air Force, 18 pages. Defines parcels and buildings.
NOPb-67	"Lands and Facilities to be Transferred to the Department of the Air Force", no date, 11 pages.
NOPb-68	Memo to Assistant Secretary for the Air Force (Materiel) from F.H. Huggins, Assistant Secretary of the Army dated 9/30/51, 3 pages. Property requirements for communications systems.
NOPb-69	Report of Excess Real Property to General Services Administration, Kansas City, MO, dated 4/6/60, 2 pages. Withdrawal of 960,000 excess acres for subsequent transfer to Air Force.
NOPb-70	Schedule B - Supplement to Report of Excess Real Property - Land, undated, 11 pages. Identifies acreages and owners of parcels.
NOPb-71	Summary of acreage acquired and disposed, undated, 1 page.
NOPb-72	Realty Control File Summary (Land Acquisitions and Disposals), Nebraska Ordnance Plant, dated 5/5/72, 3 pages. Provides total breakdown of disposed of former NOP.
NOPb-73	Memo dated 6/3/65. Subject: Revised Final Audit of Land Records RE: Nebraska Ordnance Plant, Audited Installation No. 2048, 1 page. Details of final property audit.
NOPb-74	List of parcels acquired for NOP, dated 6/15/43, 3 pages.
NOPb-75	Letter - Dale Kent, Chief, Real Estate Division, Missouri River Division Corps of Engineers to Regional Director, General Services Administration, Kansas City, MO, dated 12/18/59, 2 pages. Described buildings contaminated with Amatol, Comp. B, TNT, smokeless or propellant powder, tritonal, or tetryl.
NOPb-76	Phillip O. Stewart, "Attorney's Certificate and Report" concerning Report of Excess Real Property, dated 12/14/59, 6 pages. Defines parcels and acreages acquired by fee or condemnation and leases.
NOPb-77	Memo - Chief, Real Estate Division "Nebraska Ordnance Plant, Remaining Fee Area of 83.04 Acres" dated 12/18/68, 2 pages. Discusses intended final disposition of 83.04 acres including burn pit and sewer disposal area.

<p style="text-align: center;">REFERENCES FORMBER NEBRASKA ORDNANCE PLANT SASR 1993</p>	
NOPb-78	Memo to District Engineer, U.S. Army Engineer District, Omaha, Nebraska from MRDGM-D dated 11/24/69, Subject: Real Estate Requirements - Omaha Auxiliary Sites - Nebraska Ordnance Plant, 4 pages. Information concerning intended liquid oxygen, liquid nitrogen, disposal site on NOP property.
NOPb-79	Disposition Form re: "Disposal Area for Liquid Oxygen and Liquid Nitrogen, Nebraska Ordnance Plant" to Real Estate Division from Engineering Division, Missouri River Division, Omaha, dated 11/59, 5 pages. Identifies design criteria for liquid oxygen, nitrogen HP-1 fuel and solid propellants.
NOPb-80	Memo from Chief, Real Estate Division, Omaha, Subject: Property to be Transferred to Air Force, dated 7/22/59, 3 pages.
NOPb-81	Summary Sheet - Department of the Army Submitted by Office, Chief of Engineers Real Estate Disposal Project No. 147A dated 10/20/59, 2 pages. Describes the proposed transfer of a part of the Nebraska Ordnance Plant; Saunders County, Nebraska, to the Department of the Air Force, and report of the remainder to General Services Administration as excess real property.
NOPb-82	Letter from Ordnance Corps Nebraska Ordnance Plant, Wahoo, Nebraska to District Engineers, Omaha District, dated 4/30/59, 10 pages. Subject: Disposal of Nebraska Ordnance Plant. Describes contamination of buildings with Amatol, Comp. B, TNT, smokeless or propellant powder, tritonal, or tetryl. Describes decontamination recommendations.
NOPb-83	Memo from Ordnance Corps Nebraska Ordnance Plant, Wahoo, Nebraska to Deputy Chief of Staff for Logistics, Department of the Army, Washington, D.C. dated 3/4/59, 6 pages. Subject: Declaration of Excess - Nebraska Ordnance Plant. Summary of facilities.
NOPb-84	Lease Map. Identifies Air Force Properties. No date.
NOPb-85	NOP Regional Map. Relationship of NOP to Omaha, Lincoln. No date.
NOPb-86	Map (partial) showing A-parcels NOP. Dated 11/5/44.
NOPb-87	Lease Map. NOP, shows restricted areas, waste buds. Dated 12/15/44.
NOPb-88	Proposed locations of University activities at NOP. Approximately 1962.

REFERENCES
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NOPb-89	Map excerpts entitled "Survey for GSA" September 1961. Shows boundaries of sewage plant, burning pit area, other excluded areas.
NOPb-90	Map showing Burning Pit and Sewer Disposal areas, undated.
NOPb-91	Lease Map, shows contaminated building locations.
NOPb-92	NOP Reservation Map, updated 8-18-59.
NOPb-93	Real Estate Map, "A Segment" Acquisition Tracts, 2-3-48.
NOPb-94	Real Estate Map, "B Segment" Acquisition Tracts, 2-3-48.
NOPb-95	Map (partial) shows property disposed to University of Nebraska.
NOPb-96	Real Estate Map, "C Segment" Acquisition Tracts, undated, identifies disposal.
NOPb-97	Real Estate Map, "D Segment" Acquisition Tracts, June 15, 1943, identifies disposal.
NOPb-98	Real Estate Map, NOP, "A Segment" (partial) acquisition tracts, shows parcels withheld from disposal.
NOPb-99	Real Estate Map, NOP, "B Segment" (partial) acquisition tracts, shows parcels withheld from disposal.
NOPb-100	Real Estate Map, NOP, "C Segment" (partial) acquisition tracts, shows parcels withheld from disposal.
NOPb-101	Real Estate Map, NOP, "D Segment" (partial) acquisition tracts, shows parcels withheld from disposal.
NOPb-102	Real Estate Map, "A Segment" (partial) acquisition tracts, identifies new owners of "A" parcels.
NOPb-103	Real Estate Map, "B Segment" (partial) acquisition tracts, identifies new owners of "B" parcels.
NOPb-104	Real Estate Map, "C Segment" (partial) acquisition tracts, identifies new owner of "C" parcels.
NOPb-105	Real Estate Map, "D Segment" (partial) acquisition tracts, identifies new owners of "D" parcels.
NOPb-106	Map, "Land Requirements for 'M' Day Operations," dated 2-13-56. Shows safety areas for existing and proposed explosives operations areas.

<p style="text-align: center;">REFERENCES FORMBER NEBRASKA ORDNANCE PLANT SASR 1993</p>	
NOPb-107	NOP Plant Reservation Map, Decontamination Survey, April 6-10, 1959, conducted by L.Dudeck, Representative, OAC.
NOPb-108	Real Estate Map, "D Parcels," marked "area in blue to be withdrawn for assignment to 5th US Army and license to Nebraska National Guard."
NOPb-109	NOP Lease Map, no date.
NOPb-110	NOP Land Acquisition Map, A, B, C, D Parcels titled "NOP Complete Disposal".
NOPb-111	Telephone directories from 10-1-59 and 12-30-59. Includes Offutt Auxiliary AFB personnel
NOPb-112	Photos of 3.5" rocket production, booster production, and other miscellaneous production. 30 June 57, 2 pages and "Facts about NOP", 1 page.
NOPb-113	Informational booklet on NOP 31 July 1958 with photos of production lines with narrative, 11 pages.
NOPb-114	"NOP News" - Plant newspaper 22 June 56, 8 pages.
NOPb-115	"NOP News" - 14 January 55, 8 pages.
NOPb-116	Letter from US Department of Justice to H. Berman 1-31-92.
Note:	Items NOPb-90 through 95 are from the personal papers of Harry and Twila Berman, 507 W. 2nd Street, Wahoo, NE 68066.
NOPb-117	Lease Map NOP December 14, 1944.
NOPb-118	Historical Summary of NOP from History of Saunders County, Nebraska. ca 1992
NOPb-119	Data and construction detail drawings for Floodwater Retarding Structure 22-A, Clear Creek Watershed. 1973 USDA, SCS
NOPb-120	Personal Communication with John Jurgiel, former Offutt AFB Safety Officer, June 28, 1993
NOPb-121	Letter from Corps of Engineers to NOP requesting allocation of administrative and laboratory space at NOP, 4 pages, 18 August 1958
NOPb-122	Letter from SAC to Ordnance Commander, Joliet, IL stating requirement for SAC transmitter site near NOP. Also included are responses, 5 pages, 3 September 1958

<p style="text-align: center;">REFERENCES FORMER NEBRASKA ORDNANCE PLANT SASR 1993</p>	
NOPb-123	Letter to Ordnance Commander Joliet, IL regarding JATO MK4 and MK6. also included are responses, 5 pages, 22 April 1955
NOPb-124	Interview with Mr. Chick Hastert, former Civilian-in-Charge at NOP, August 24, 1993, in Wahoo, NE
NOPb-125	Interview with Mr. Mac McManamen, Facilities Manager at University of Nebraska, ARDC, near Mead, NE
NOPb-126	Interview with Larry Angle of the Lower North Platte, Natural Resources District, August 25, 1993 in Wahoo, NE
NOPb-127	Interview with Randy Gunn of the Saunders County Soil Conservation Service (USDA-SCS), August 26, 1993 in Wahoo, NE
NOPb-128	Former Nebraska Ordnance Works Confirmation Study, Volume 1, Report and Appendices A & B. Kansas City District, Corps of Engineers. Ca 1988
NOPb-129	Follow-up telephone communication with M. MacManamen, C. Hastert, and C. Twing, December 1, 1993.

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- NOP-0001 - DERP Inventory Project Report, Corps of Engineers, July, 1989.
- NOP-0002 - Newspaper Article on NOP, June 6, 1944.
- NOP-0003 - Cover Sheet of Archives Search Report of the Former NOP, NE, July 1983, Report #A017.
- NOP-0004 - Ordnance War Administration History - GOCO Facilities Directory. 1946, U.S. Army Ordnance Corps.
- NOP-0005 - Industrial Facilities Inventory, 1944.
- NOP-0006 - HQ Ordnance Ammunition Command Historical Summary, 1961.
- NOP-0007 - Scope of Work, Study to Determine Level of Ordnance Contamination of Former NOP, Mead, NE, Huntisville Division, Corps of Engineers, 1989.
- NOP-0008 - USDA, SCS, 1989. Soil Description Report, Saunders County, NE.
- NOP-0009 - EPA, Aerial Photo Analysis, 1949-1987.
- NOP-0010 - Archives Search Report. (See Reference NOP-0003)
- NOP-0011 - Packet of Letters and Maps, Investigation of Watershed Site 22A.
- NOP-0012 - Interviews with Plant Workers, June 1989, conducted by R.M. Duante and J. Montgomery, Corps of Engineers.
- NOP-0013 - Work Plan of Remedial Action, Former NOP.
- NOP-0014 - U.S. Army Corps of Engineers, Kansas City District. Ca 1989. Inventory Project Report for Formerly Used Defense Site Policy Considerations, NOP, Mead, NE.
- NOP-0015 - USGS Topo Quad, Mead, Nebraska, 1969.
- NOP-0016 - USGS Topo Quad, Ashland West, Nebraska, 1969.
- NOP-0017 - USGS Topo Quad, Wann, Nebraska, 1968.

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(Continued)

- NOP-0018 - USGS Topo Quad, Wahoo East, Nebraska, 1969.
- NOP-0019 - Map of Previous Ownership.
- NOP-0020 - History of NOP Part 1, 1942; Part 5, 1943; Part 12, 1945; Part 13, 1945; Part 14, 1946.
- NOP-0021 - Well Logs (1942) for 12 Wells.
- NOP-0022 - Completion Report - Soils Data.
- NOP-0023 - GSA, 1960, Building Structures, Utilities, and Miscellaneous Facilities.
- NOP-0024 - Memo on Storage of Smokeless Powder.
- NOP-0025 - Memo on GOCO, 1954.
- NOP-0026 - Reference to GO-CO National Gypsum, 1955.
- NOP-0027 - Decontamination Survey, 1960.
- NOP-0028 - Booster Load Line Decontamination Survey, 1959.
- NOP-0029 - Site Map. Decontamination Survey, 1959.
- NOP-0030 - Load Line 1 Decontamination Survey Map, 1959.
- NOP-0031 - Load Line 4 Decontamination Survey Map, 1959.
- NOP-0032 - Load Line 2 Decontamination Survey Map, 1959.
- NOP-0033 - Load Line 3 Decontamination Survey Map, 1959.
- NOP-0034 - Map, Boundaries of Land Transfer, 1965.
- NOP-0035 - Memo re: Construction to Increase Load Capacity.
- NOP-0036 - Ammonium Nitrate Production, 1945 - 1950.